

Coal for Victory

OCTOBER 1943

COAL AGE

McGRAW-HILL PUBLISHING COMPANY, INC.

OCT 22 1943

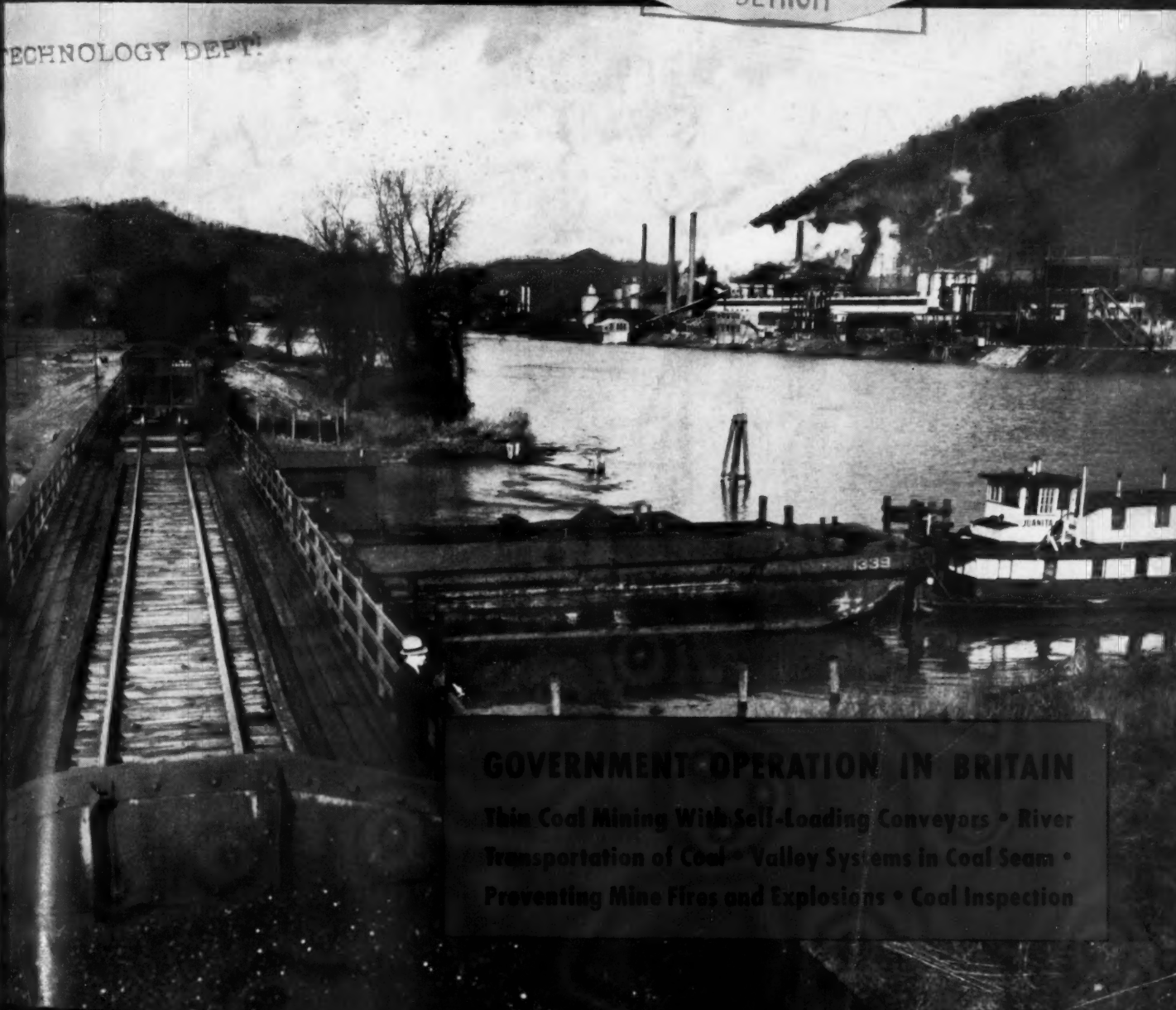
DETROIT

Price 35 Cents

TECHNOLOGY DEPT.

GOVERNMENT OPERATION IN BRITAIN

Thin Coal Mining With Self-Loading Conveyors • River
Transportation of Coal • Valley Systems in Coal Seam •
Preventing Mine Fires and Explosions • Coal Inspection





KEEP LOADERS
"On The Double"

SOLNUS HYDRAULIC OILS

Help Loaders Operate on Double Shift With No Sludge... Less Trouble

Loading coal from mine face to cars or conveyors is a production "bottleneck" in every mine. Trouble here slows down the entire mine's output! SOLNUS Hydraulic Oils have proved their value in helping to keep loaders on the job with minimum downtime for cleaning or service and at the lowest possible cost.

Here's a typical example. Dissatisfaction with the performance of a well-known brand of oil used in the hydraulic system of a loader led to a switch to SOLNUS Hydraulic Oil. After 8 months of service, here is the record: formed no sludge... maintained

good body... ran 2 shifts a day, 6 days a week, between changes... reduced quantity of oil used. This is a saving in both trouble and cost that will help to keep this mine's production "bottleneck" wide open.

SOLNUS Hydraulic Oil and SUN "Doctors of Industry" are aiding many mines to keep hydraulic equipment in continuous "all-out" production at minimum cost. Talk over your own problems with a SUN Engineer. His broad experience and "know how" are at your service. Write to...

SUN OIL COMPANY • Philadelphia

Sun Oil Company, Limited, Toronto, Canada

SUN INDUSTRIAL PRODUCTS



HELPING INDUSTRY HELP AMERICA

In war or peace
B.F. Goodrich
FIRST IN RUBBER



The rubber navy—a fleet a week

A typical example of B. F. Goodrich improvement in rubber

THAT workman is unfolding a ship. When it's unwrapped and pumped up, it will be another of those cargo carrying boats you see in the background—able to carry 6,000 pounds.

The navy wanted a boat capable of carrying supplies from ships to shores where there were no docks. They wanted it of rubber so several could be carried, collapsed, on a supply ship without taking up valuable space—and pumped up when needed. Several companies started making them.

The accepted method was to cure rubberized fabric, cut it to shape, and cement the edges. As many as seven coats of cement were needed; each had to dry; and even then the seam was none too strong.

B. F. Goodrich men set out to find a better, faster way. They built forms, the shape of the finished boat. Then they cut the uncured rubberized fabric, shaped it over these forms, and vulcanized it. In vulcanizing, the rubber flowed together at the seams, making a stronger joint. Only one coat of

cement was needed. The result by the B. F. Goodrich method was a stronger boat made in less time. Vulcanizing at first took 15 hours. New methods brought it down to three hours and finally to only 50 minutes.

B. F. Goodrich is turning out a whole fleet every week (the number is secret) and has made its methods and experience available to all other manufacturers. *The B. F. Goodrich Co., Industrial Products Division, Akron, Ohio.*

B.F. Goodrich
RUBBER and SYNTHETIC products



**DONE
THING**




... and do it supremely well

The child, who was crippled, plays again, because of the work of a great Surgeon... through the supreme quality of his skill, developed by years of specialization. . . . For $\frac{3}{4}$ of a century Hulburt has been specializing in one thing... making Grease of supreme Quality, solely for lubricating coal mine equipment.

HULBURT OIL & GREASE COMPANY
Specialists in Coal Mine Lubrication
PHILADELPHIA, PENNSYLVANIA

HULBURT
Quality
GREASE

PHILCO BATTERIES pack the extra wallop you need for today's mining service!

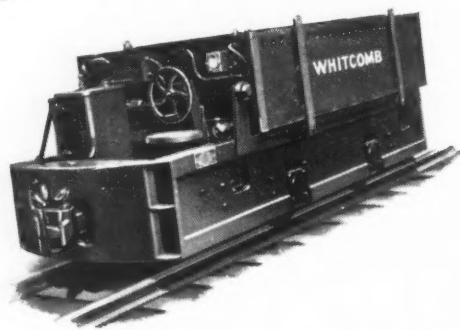
 Never in mining history
has America needed greater
production . . . or needed it faster!

For that reason Philco Locomotive
Batteries today contribute more to
successful mine operation than ever
before! Every Philco cell is engineered
to give you *extra wallop*—the surge of
power needed to pick up a long trip
of loaded cars from a standing start,
and haul them away in a hurry!

You get maximum capacity, too.
Philco Batteries keep locomotives in
operation long after ordinary batteries
are back on the charging racks!

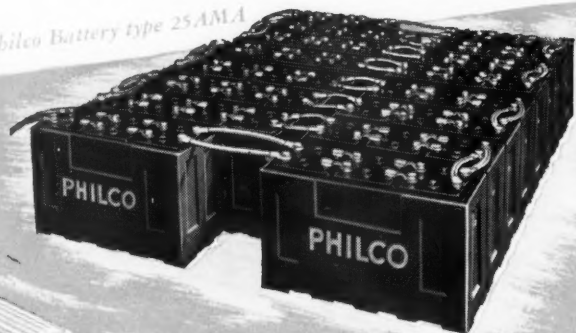
On your next replacement, get the
facts on Philco Batteries. Call your
local Philco representative or write
direct for latest mine battery catalog.

PHILCO CORPORATION
STORAGE BATTERY DIVISION
TRENTON 7, NEW JERSEY



Replace with
PHILCO
Mine Batteries

50 cells of Philco Battery type 25AMA



CONTENTS

VOLUME 48

OCTOBER, 1943

NUMBER 10

COAL AGE

COAL AGE (with which is consolidated "The Colliery Engineer" and "Mines and Minerals") is published monthly on the 1st. Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, Coal Age, 330 West 42d Street, New York 18, N. Y.

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330 West 42d Street, New York, N. Y.

Director of Circulation:
Please change my address on Coal Age

From

To

Signed

COMING COAL AGE ATTRACTIONS

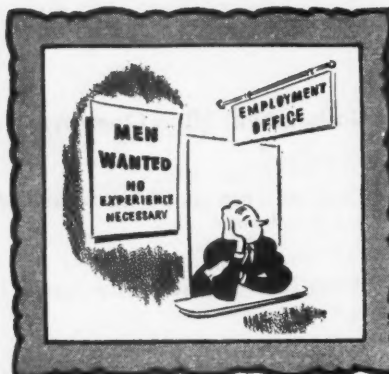
• Electric power has been described as the lifeblood of coal mining. Its efficiency is in part governed by the primary distribution voltage. Among the latest to change voltage for greater performance is the Nellis (W. Va.) mine of the American Rolling Mill Co. How the transfer from 2,300 to 4,000 volts was done in two five-year steps is the subject of a detailed article scheduled for early publication, along with other material on power supply.

• Mechanical - mining progress has played a major part in the coal industry's ability to meet wartime fuel demands. The problem now is even tougher and the need for efficiency is greater than ever. Coal Age therefore will offer in an early issue a discussion of track layouts for mechanical mining, in addition to other articles on new mechanical mines and installations in Alabama, Illinois and elsewhere, plus data on timbering and other activities.

• Strip-mining material for future use includes a study of drainage problems and detailed descriptions of new outcrop mining in the eastern and southern states. Barricades as a safety measure in case of mine explosions and fires are among the safety subjects on deck. Training problems will constitute a major item in a series on manpower now in preparation. And, on the unusual side, will be a description of Rivercoal, Inc., dredging work.

Pick Your Picture!

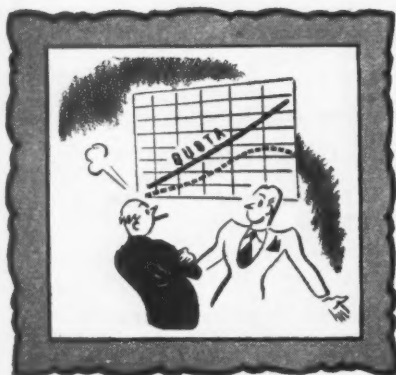
Here are 5 of the toughest problems facing Coal Operators today. Pick yours — then note how much help you can get from Allis-Chalmers Cooperative Engineering in solving them!



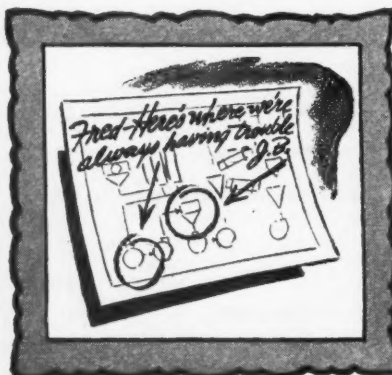
LABOR SHORTAGE? Does part of your process use men unnecessarily? Milling is a machine industry!



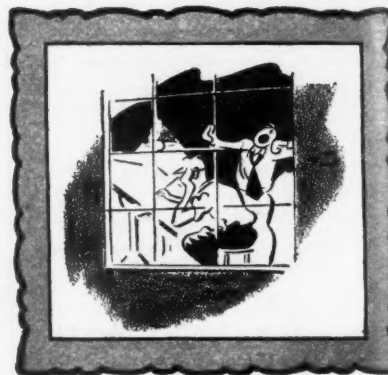
UNEXPECTED BREAKDOWNS? How many of your key machines were designed for 24-hour-day service?



LAGGING SCHEDULES? Maybe you have a bottleneck machine — an added machine would load up other units.



WEAK-SISTER MACHINERY? Some units that used to "get by" need too much maintenance today.



OVERWORKED ENGINEERS? Outside engineering cooperation might clean up many tough jobs quickly.

WHICHEVER IT IS — CALL ON ALLIS-CHALMERS!

MEN MUST WORK together better than ever before to win this war . . . and so must machines! One company specializes in making machines "team up" . . . Allis-Chalmers.

Here's a company that engineers and builds all types of basic equipment — that knows how to make the various units fit together, work together! Teamwork is our business!

Put Allis-Chalmers Cooperative Engineering to work on your problem. No obligation, of course. Call your nearby A-C district office. Or write ALLIS-CHALMERS, MILWAUKEE 1, WIS.



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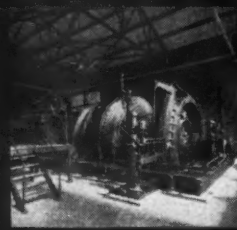
Only Allis-Chalmers Makes a Complete Line of this Equipment . . .



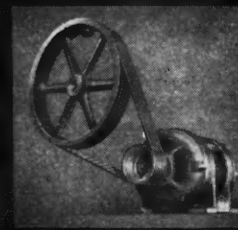
VIBRATING SCREENS — Efficient separation and de-watering — 8 different types.



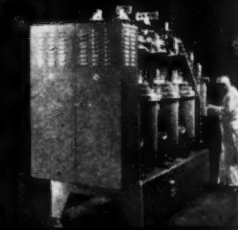
CENTRIFUGAL PUMPS — Largest line, highest efficiencies — built with motors.



MINE HOISTS — Completely automatic control with new "Regulex" exciter.



MOTORS & DRIVES — Top team — Lo-Maintenance Motor & Texrope V-belts.



RECTIFIERS — Low-loss conversion of a-c into versatile d-c current.

COALMASTER

Precision

**IN
ENGINEERING**

means

- 1 Increased production at lower cost
- 2 Trouble-free performance
- 3 Tools designed for every type of job
- 4 Elimination of excess weight
- 5 Maximum safety for driller
- 6 Accurate alignment for smooth vibrationless operation
- 7 Adapted to all powder sizes — Cardox and Airdox
- 8 Hexanspeed coupling operates without nails, cotters, or hammers
- 9 All COALMASTER tools are matched sets

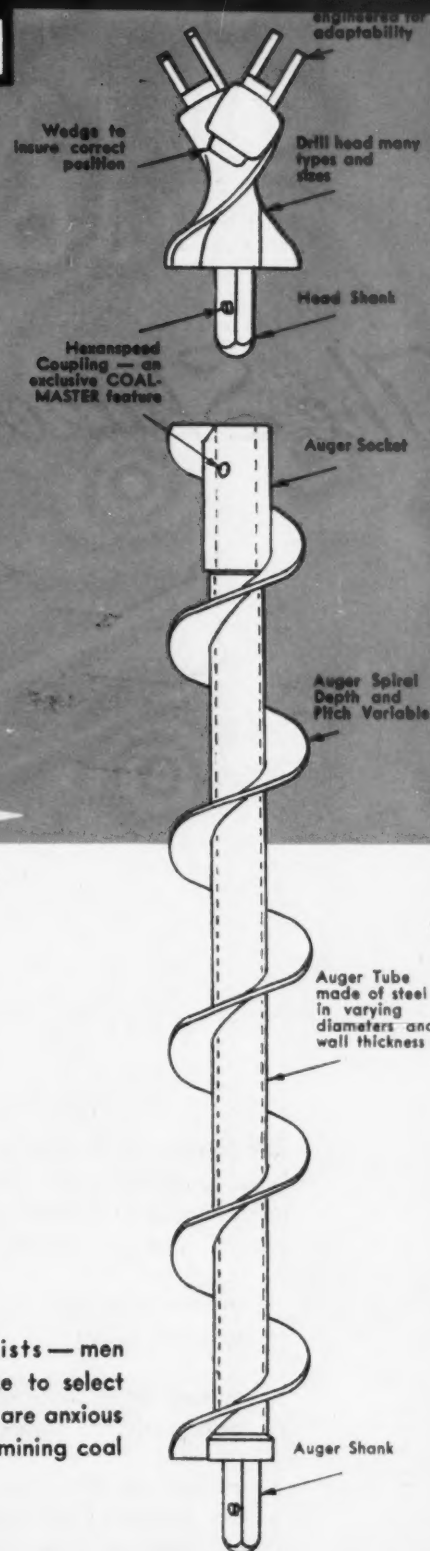
Our Representatives are drilling specialists — men trained by experience to select the tools that will meet your particular requirements best. They are anxious to help you solve your drilling problems with the objective of mining coal at minimum cost.

COALMASTER

**BLAST HOLE
DRILLING**

Tools

CENTRAL MINE EQUIPMENT CO.
ST. LOUIS, MO.



low de-

side up

to se. ite

PLAN FOR PEACE

A 1594-A

low-loss to ver-

AL AGE

TYPE E AUTOMATIC DUCKBILL

The Shaker Conveyor Loading Head



The Goodman Duckbill's past record of performance has been outstandingly prominent in mine mechanization achievements. These new operating advantages will assure even greater popularity among mine men:

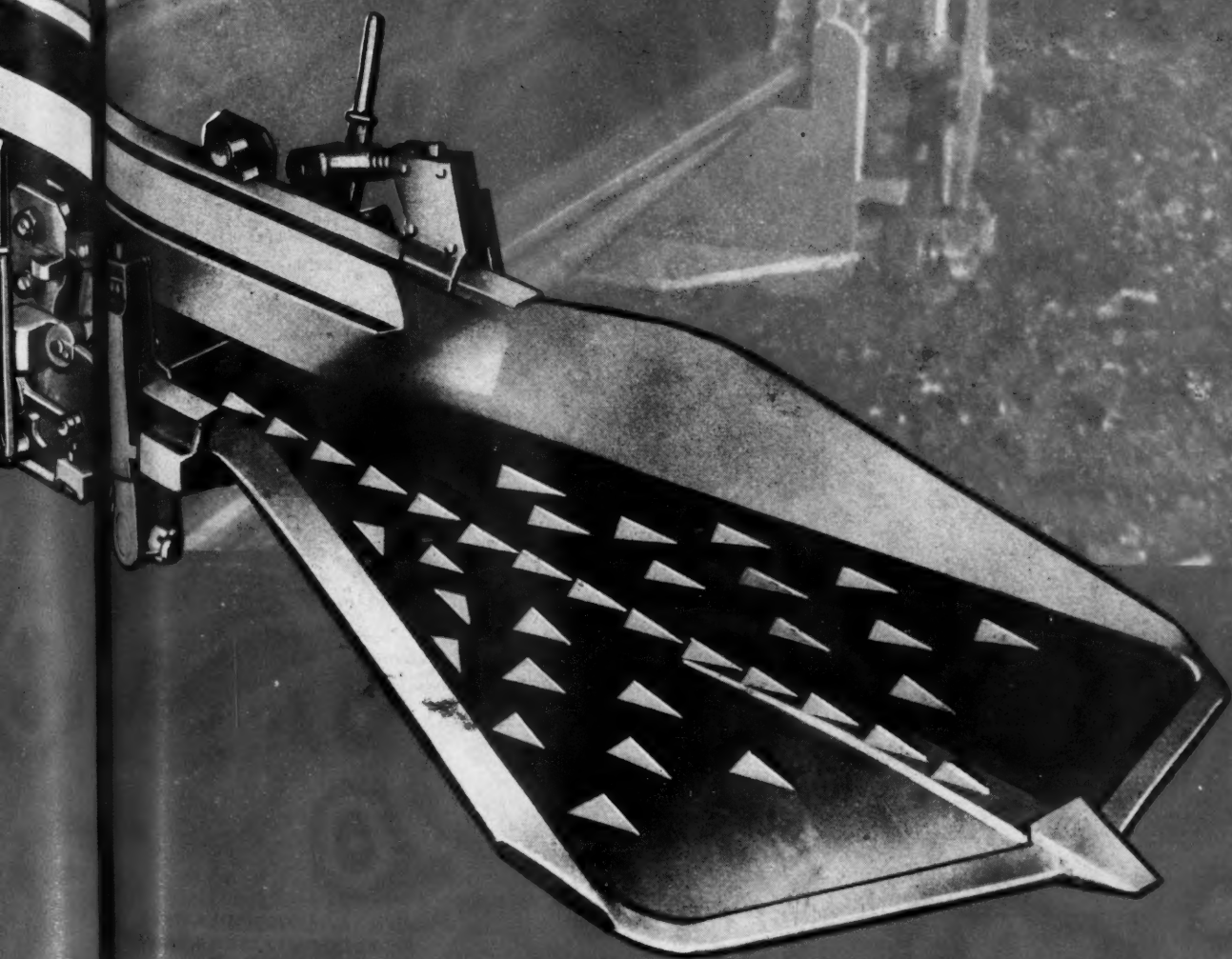
- greater extension of the shovel trough permits cleanup of wider faces
- spring type bumpers on sliding shoe and shovel trough absorb shock, decrease noise of operation
- control handles can be operated independently of the stroke of the conveyor line. All "kick" in the handles has been eliminated

*Send for a copy of our new
Shaker Conveyor Bulletin, CC-424*



GOODMAN MANUFACTURING COMPANY

ad with Latest Improved Features



Y
HALSTED STREET AT 48TH • CHICAGO, ILLINOIS

WHEN OUNCES FEEL LIKE POUNDS



*Reg. U. S. Pat. Office



1230 SIXTH AVENUE
ROCKEFELLER CENTER, NEW YORK

UNITED STATES

October, 1943 • COAL AGE

ND... ASSAULT TROOPS USE LAYTEX*

You know how it is. You slog along all day under full equipment. At first you don't mind the weight very much. But as the hours crawl along, everything you're toting gets heavier and heavier. The canteen you didn't notice in the early stages now weighs as much as your rifle did then. And your rifle feels like a howitzer. Every ounce turns into a pound.

That's why . . . when you're moving fast and the going is tough . . . it's smart to use Laytex Assault Wire.

A full mile of Laytex Assault Wire weighs less than 30 pounds.

Laytex Assault Wire has a breaking strength of 50 pounds per conductor and a talking distance of more than 5 miles.

Laytex resists concussion and a wide range of temperature changes.

It is flexible and waterproof, strong and tough.

Conductors are accurately centered and the weight of insulation and the diameter of the insulated conductor are kept at the minimum.

All this adds up to the fact that one man, wearing a breast reel of Laytex Assault Wire can move swiftly and easily. One man can maintain sure communication with operational headquarters.

Listen to the Philharmonic Symphony program over the CBS network Sunday afternoon, 3:00 to 4:30 E.W.T. Carl Van Doren and a guest star present an interlude of historical significance.

TH AVENUE
INTER, NEW YORK

TESTATES RUBBER COMPANY

for GREATER TONNAGE from

FOLLOW THESE CHARTS

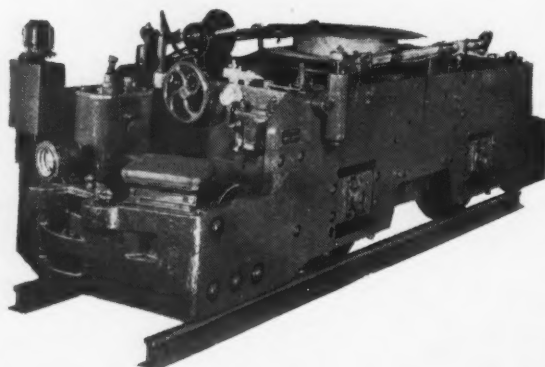
ENTERING the last quarter of the year intent upon producing the greatest tonnage ever mined, operators *know* proper care of mechanized equipment is the most important factor in producing this record tonnage.

Prominent operators everywhere are keeping their cutters, loaders and locomotives on the job producing greater tonnage by following Texaco Maintenance Lubrication Charts.

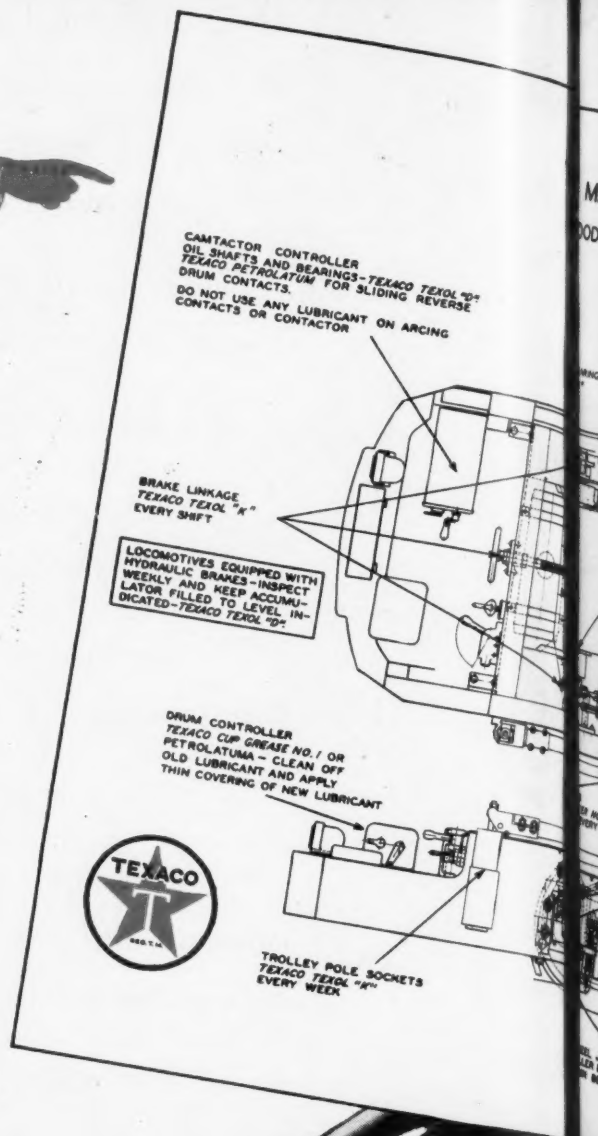
Developed in cooperation with prominent equipment makers, Texaco Maintenance Lubrication Charts, size 12" x 18", show the "greenest hand" just *where*, *when* and with *what* lubricant to service the various makes of cutters, loaders, locomotives, shuttle cars, etc., with lubricants approved by the manufacturer.

The use of Texaco Maintenance Lubrication Charts at all lubricating stations assures maximum life from your equipment and less time out for repairs. Order by make and model from—

The Texas Company, *National Sales Division*, Dept. C, 135 East 42nd Street, New York 17, N. Y.

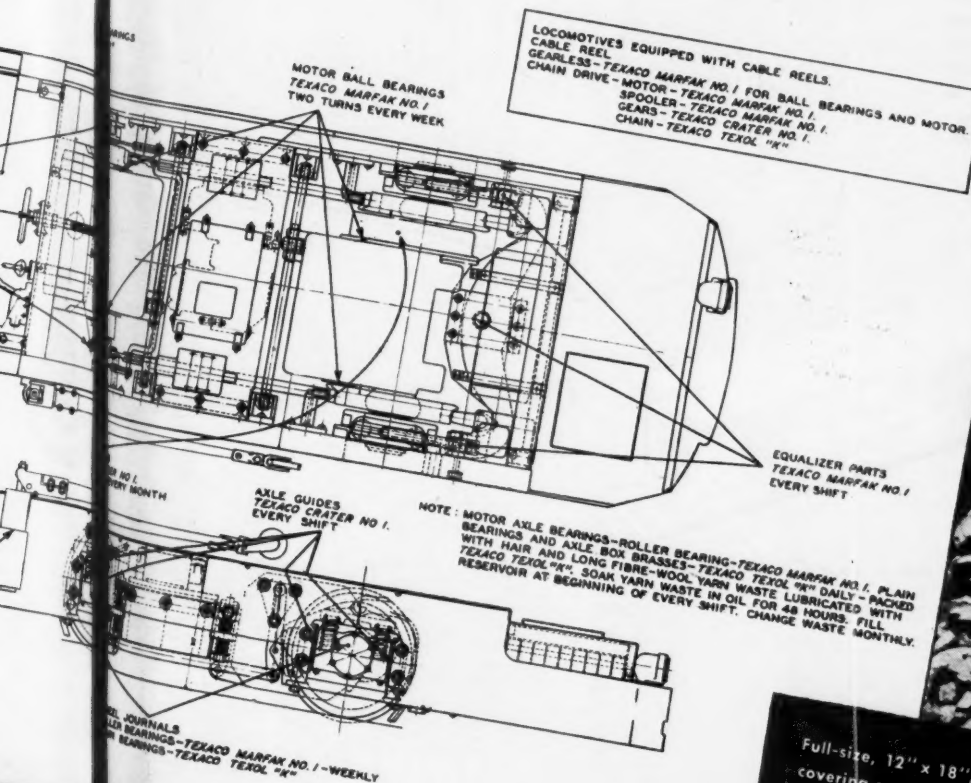


TEXACO LUBRICANTS fo



om Cutters, Loaders, Locomotives

MAINTENANCE LUBRICATION CHART WOODMAN MINE LOCOMOTIVE-TYPICAL

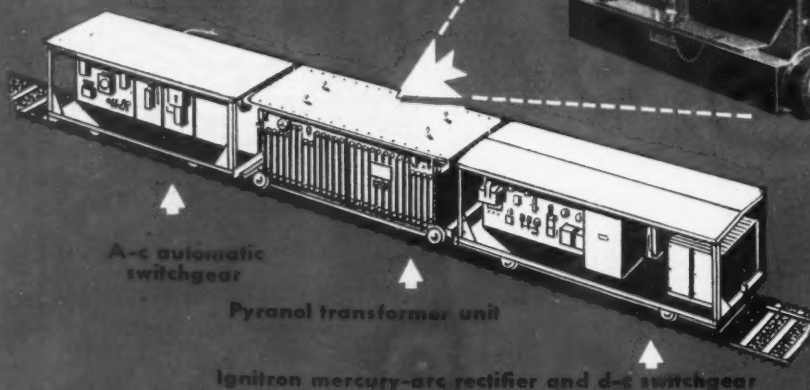
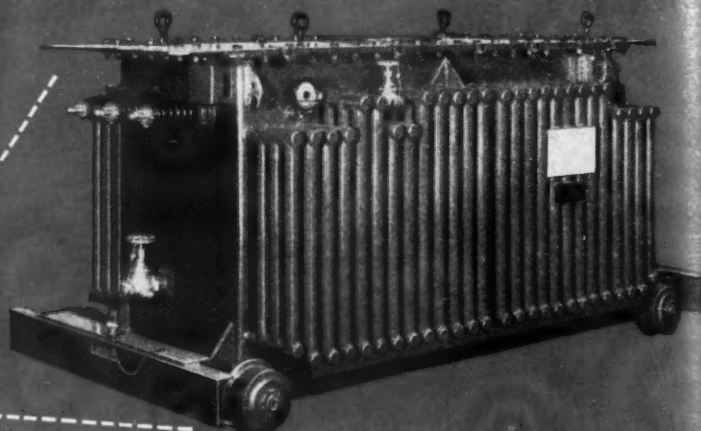


Full-size, 12" x 18", Charts are available covering prominent makes of underground machinery. Order by make and model today, using Company letterhead, please.

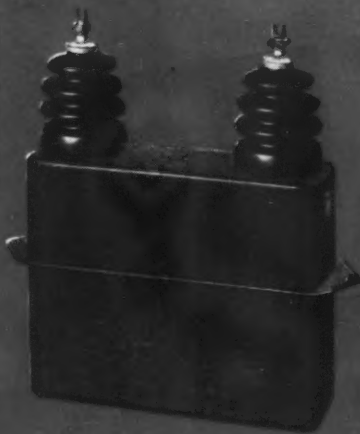
for the Coal Mining Industry

How many tons are you losing

G-E portable underground substations consist of three car-mounted units (below). The transformer car is compact, completely sealed against dust, dirt and moisture. It is suitable for use underground without vaults or safety enclosures—thanks to the use of Pyranol, G.E.'s non-inflammable insulating and cooling liquid.



Pyranol capacitors (sealed type shown here) help improve power factor on a-c circuits around the mill or tippie. They enable circuits to carry more load, and improve voltage conditions.



Installed underground without enclosure, these G-E Pyranol transformers have high dielectric strength to withstand switching surges, and ample capacity to carry emergency overloads.

The best investment in the world is in this country's future—BUY WAR BONDS

ng because of

Undelivered Volts?

Production losses running into hundreds of tons per day may result from voltage drop between substation and working face. For example, Coal Age calculates that with a drop of 50 volts, output falls 9.3 tons per man-shift. Equipment cannot operate "all out" when power isn't "all there" at the application point.

First step in any program to maintain full voltage at the working face is to eliminate the large voltage drop encountered in long, low-voltage d-c feeder runs. G-E portable substations for use underground, made possible by the use of Pyranol transformers, enable you to do just that.

Designed for use *without* protective firewalls, G-E Pyranol* transformers can be placed almost anywhere in the mine. When teamed up with G-E portable, sealed-ignitron, mercury-arc rectifiers, and special G-E mine

*Pyranol is General Electric's trade-mark for a synthetic cooling and insulating liquid that will not burn.

GENERAL  ELECTRIC

657-23-204

G-E engineers offer experienced help on all phases of mine electrification—locomotives, motors, control, switchgear, and power-conversion equipment, above ground or underground.

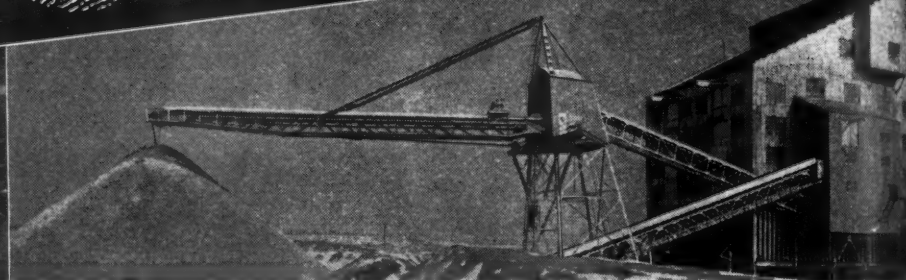
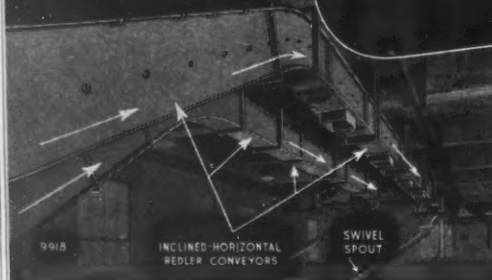
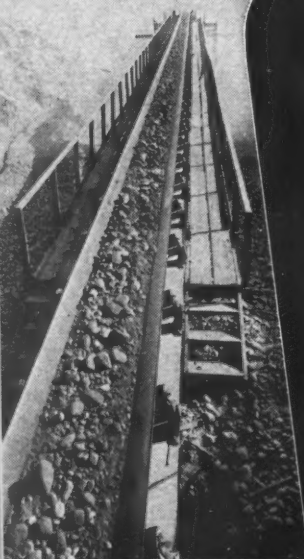
switchgear, they make it practicable to convert to d-c thousands of feet closer to the face. This not only means full voltage for most efficient operation of equipment, but it also saves tons of critically scarce copper.

In addition to their use as a part of portable underground substations, Pyranol transformers in stationary installations are helping many coal mines to maintain full voltage and high output. Above ground and below ground, these and other Pyranol-filled equipment promote safety, simplicity, and efficiency. For the complete story, call the G-E office near you. *General Electric, Schenectady, N. Y.*


**PYRANOL
TRANSFORMERS**

A-434

LIKE FINGERPRINTS
No Two Conveying Jobs
Are Alike



Each Demands Competent, Experienced Engineering

● Every plant man knows that the efficiency of an industrial operation depends greatly on getting the right material at the right place at the right time.

But extreme variations occur in these three conditions—materials, place and time—not only from industry to industry but even within a single plant. Consequently, the engineering of successful material handling systems becomes a complex matter of matching the right type of conveying equipment and accessories to each specific job.

This is a highly specialized service, but one for which Stephens-Adamson engineers are fully qualified. For S-A designs and makes ALL kinds of conveying equipment. Whether a job calls for a belt,

bucket or screw conveyor—or for a combination of these types—plus whatever accessories may be required—trust the S-A representative for an unbiased recommendation as to the exact system needed to move materials faster, safer and at lower cost.

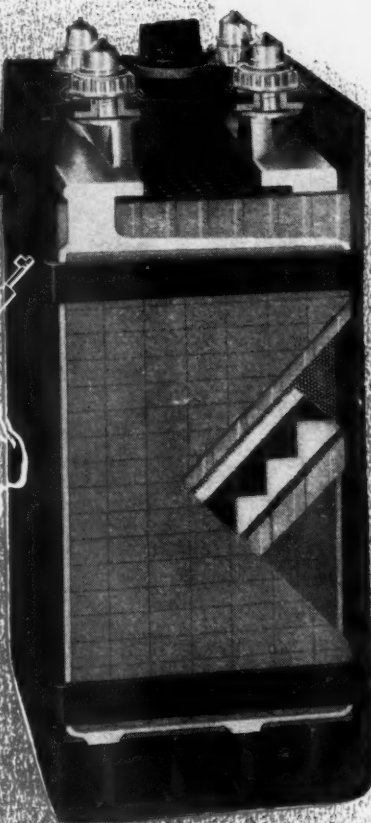
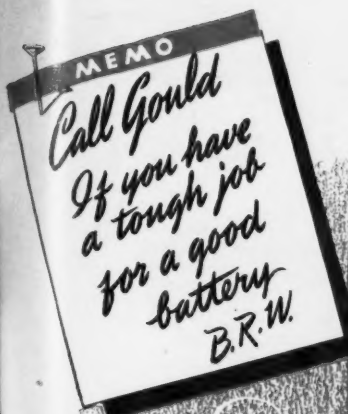
If you face the problem of modernizing or expanding existing handling equipment to meet present production demands . . . or if you are concerned over new material handling problems that will come with post-war operations . . . have a talk with an S-A engineer now. Write us today.

STEPHENS-ADAMSON MFG. CO.
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STEPHENS-ADAMSON

MFG. CO.

Designers and Manufacturers of All Types of
BULK MATERIAL HANDLING EQUIPMENT



THE BATTERY THAT WILL PASS INSPECTION

• Organization, training and discipline make fighting troops. 45 years of storage battery building have given Gould an organization of trained personnel . . . engineers, skilled workers, service and maintenance men, who are ready to go into action when you "CALL GOULD". Trained to analyze and solve battery problems and disciplined on the firing line of battery performance, Gould has learned to turn out "fighting batteries". They continue to pass inspection year after year. The Gould Kathanode . . . the original spun-glass battery . . . represents the cumulative knowledge of 20 years of actual field operation. This construction is your guarantee of high sustained capacity and long battery life.

Rated Conservatively . . . Goulds equal or exceed in capacity any battery of comparable size and cell structure.

GOULD STORAGE BATTERY CORPORATION, DEPEW, NEW YORK

Builders of industrial batteries for every application. Sales and service offices in principal cities of the U. S. A. Factories at Depew, N. Y., North Bergen, N. J., Dallas, Atlanta, Chicago, St. Paul, Leavenworth, Los Angeles



FOR EXCELLENCE IN STORAGE BATTERY PRODUCTION AT DEPEW PLANT

GOULD

Since 1898 THE BATTERY PICKED BY ENGINEERS

CHECK WATER

One of a series of service suggestions for users of industrial batteries.

► An essential in the maintenance of your storage battery is the addition of pure water to keep the plates covered. This is important in all types of batteries because that portion of the plates extending above the water level is not taking part in the charging and discharging operations. In other words, the capacity of each cell is reduced in direct proportion to the exposure of its plates. In stationary applications low water level will also upset the floating characteristics of the installation.

A low water level also means a greater concentration of acid within the cell. Should this strength exceed 1.300 Sp. Gr. the acid will attack wood separators. Rubber separators are not affected but in all types the stronger the acid the greater will be the effect of local action, or self discharge.

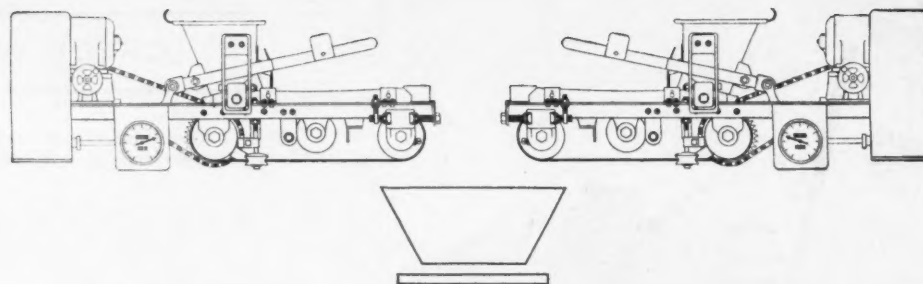
The water used in "filling" should always be added after hydrometer readings have been completed and before charging operations are started. This is because water is less dense than the electrolyte and will remain on top until some movement or the gas generated by the battery on charge causes it to mix.

Distilled water should be used where obtainable. As a substitute rain water is good, but not if collected from a metal roof. Metals, particularly iron, copper and nitrates, are the chief impurities in water which will harm the battery and should be guarded against whenever possible.

If you fill your battery with city water (and many companies do) check first with the Gould laboratory. Send us a sample of the water you use or propose to use, and let us make an analysis. We will send a report with our recommendation as to whether or not you should use it. There is no charge or other obligation for this service.

We would like you to know the Gould men who will take care of your industrial battery requirements.

Serving the Eastern Great Lakes area are the following: H. G. Frank, 13906 Rugby Road, N. E., Cleveland, Ohio; C. E. Smith, 35 Neoga St., Depew, N. Y.; R. K. Degener, 6432 Cass Ave., Detroit, Mich. In this same area is Stanley H. Smith of the Stanley H. Smith Co., 810 Republic Bldg., Cleveland, Ohio, a special representative.



"Feedometers" Proportion Coals

Indicate the feed rate and totalizes the weight fed.

Simple, accurate and easy to install.



HARDINGE EQUIPMENT

	Bulletin No.
Agitators	31-C
Clarifiers	31-C
Classifiers, Air	17-B
Classifiers, Counter-Current	39-A
Classifiers Hydro	31-C
Density Stabilizer	42
Digesters	36
Dryers	16-C
"Electric Ear"	42
Feeders, Belt	33-C
"Feedometer"	43
Filters, Sand	30-A
Metal Reclamation	8
Mills, Batch	19-A
Mills, Conical	13-D
Mixers, Slurry	31-C
Pumps, Diaphragm	32
"Ruggles-Coles" Dryers	16-C
Kilns and Coolers	16-C
Scrubbers, Conical	37
"Thermomill"	17-B
Thickeners	31-C

A typical installation consists of two size "C" Feedometers proportioning 70 tons per hour of minus 1" plus 1/4" coal and 30 tons per hour of minus 1/4" plus 0" coal. An accurate record of the weight was obtained by the use of the card printing meter. A card is inserted in the meter at the start of the run and the meter reading recorded. At the end of the run the total tonnage fed is recorded. The order or batch number is also printed on the card for a permanent record.

The two feeders were interlocked so if one bin is empty both feeders stop.

Write for Bulletin 43

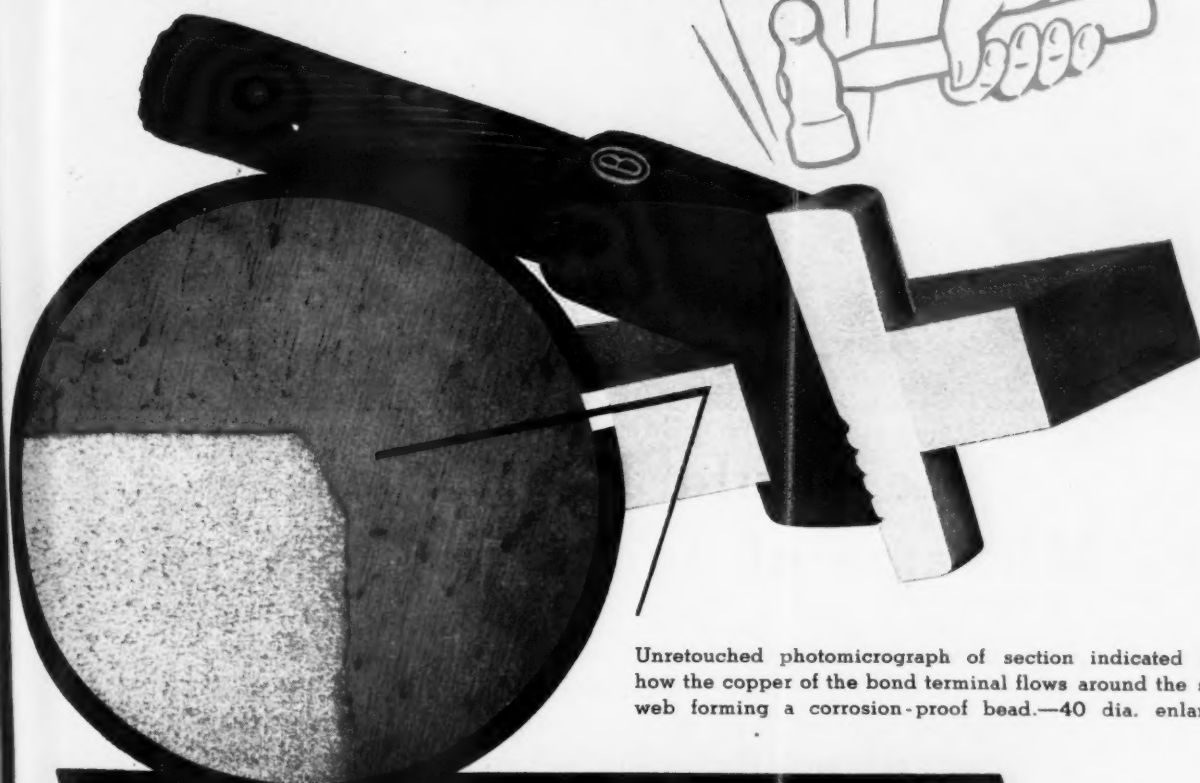
HARDINGE

COMPANY, INCORPORATED - YORK, PENNSYLVANIA

New York, 122 East 42nd Street Chicago, 205 West Wacker Drive San Francisco, 501 Howard Street Toronto, 200 Bay Street

Permanently Sealed

by a few hammer taps--



Unretouched photomicrograph of section indicated showing how the copper of the bond terminal flows around the steel rail web forming a corrosion-proof bead.—40 dia. enlargement.

**20,000 lbs. EXPANSION
PRESSURE CREATED BY
POWERFUL WEDGE ACTION—
"COLD-WELDS" O-B WEDGE
BOND TERMINAL TO RAIL WEB**

**O-B WEDGE BONDING SYSTEM---Effects Positive
Mechanical and Electrical Joint • May Be Installed Or
Reclaimed With A Few Hammer Taps • Suitable For
All Types Of Bonding, Main Haulage and Entry.**

Ohio Brass

MANSFIELD, OHIO

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONTARIO

2379-M

WRITE FOR BOOKLET 764-M

KEEP BUYING WAR BONDS

E
LVANIA
00 Bay Street

If Aladdin Were Twins -



He Could Not Equal the Miracles of Industrial Synergism

Yes, industrial synergism is the name for it. Where Aladdin rubbed his lamp to evoke the fantasies of legend, now men rub ideas against ideas to create realities far in excess of the sum total of the ideas expressed. The stimulus of men thinking together—defined as **SYNERGISM**—produces the modern magic of progress.

SYNERGISTIC thinking that rubs little ideas against each other sometimes yields outstanding "plus" results.

For example, synergistic thinking between Atlas field engineers, research men and laboratory experimenters produced the Atlas Manasite detonator—and the "plus" result was greater safety.

The extra margin of safety provided by dependable Manasite detonators has enabled

operating men to minimize accidents, reduce loss of man- and equipment-hours and cut down delay.

Of course, no detonator is fool-proof. But the mere fact that nearly 300,000,000 Atlas Manasite detonators have been used is evidence aplenty that synergism counts in giving "2 + 2 = 5" value to products. Manasite detonators cost no more and require neither special equipment nor change in methods of use.

Atlas representatives like to think synergistically with customers. Consult us when you have a blasting problem and find out how synergism can work for the individual contractor.

Manasite: Reg. U. S. Pat. Off.

ATLAS

EXPLOSIVES
"Everything for Blasting"



ATLAS POWDER COMPANY, Wilmington, 99, Del. • Offices in principal cities • Cable Address—Atpow

RAILROADS FOUND THE ANSWER 50 YEARS AGO!

**NOW YOU, TOO, CAN SOLVE YOUR HAULAGE
PROBLEMS WITH O-B AUTOMATIC COUPLING**



COAL-STREWN HAULAGE WAYS?

Smooth coupled-operation prevents undue spillage; cars stay full from face to tipple.

HIGH HAULAGE ACCIDENT RATE?

Automatic couplers lessen haulage hazards; no need to go between cars to manipulate out-moded hitchings.

LAGGING TONNAGE FLOW?

Coupling upon impact speeds loading, gathering and dumping operations.

EXCESSIVE MAINTENANCE?

Elimination of dead slack stops damaging impacts to cars; fewer time-outs for repair.

2431 AM

Ohio Brass

MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont.

KEEP BUYING WAR BONDS



WRITE FOR BOOKLET 676-AM

It's a HOG For SERVICE- -with never a grunt

★ There's only one automatic shovel type loader . . . the Whaley "Automat". It goes straight for the coal, no side kicking, no jerking—the safest loader known. With its wide shovel, its smooth running, big capacity conveyor, its ability to take the constant punching, you'll find it working in the toughest spots in the mines where two or more types of machines are engaged.

Whether you are driving entries, cleaning up falls, loading out rooms, or pulling pillars, you can depend upon the Whaley "Automat" to give you the maximum tonnage you must have from a loading machine today.

Watch the mines that use them—the leaders in the industry. Ask the men who run the mines to tell you why the "Automat" is always put on the toughest work. Ask them about its production. Ask them about maintenance. Ask them about the safety of the "Automat". This is the way to learn, first hand, what the "Automat" will do for you . . . that it's a hog for service, with never a grunt.

Then bear in mind this important power-saving fact. Only one 25 H.P. motor is required to operate the "Automat". And power consumption is only 1/5 K.W. hour per ton of material loaded. The "Automat" will give maximum production at the lowest cost per ton.

Write Myers-Whaley Company, 1103 Proctor Addn., Knoxville, 6, Tennessee.



**Mechanical Loaders
Exclusively For Over
35 Years**



and we GOT them!

"In order to get proper production costs you operators balance your mining equipment with your transportation and preparation equipment. But before you can load, transport, and prepare your coal you must first shoot it.

National "Slim-ite" Powder Series (No's 1-2-3) for the overburden in Strip Mining are new and revolutionary. The formulae of these powders are not one year old. But each month they are going on new Strip properties and proving their economy.

National Powder Company's ten Permissibles are new formulae for Deep Mines. More than Eleven Million pounds of National Permissibles have been used in Indiana, Kentucky, Ohio, Pennsylvania, Virginia, and West Virginia."

● Following tables as of United States Bureau of Mines approved list:

Permissible	BRAND	VELOCITY	CARTRIDGES PER 50 LB. CASE
High Speed	National "A"	9800 ft./sec.	1 1/4 x 8 — 142
	National "B"	12100 ft./sec.	1 1/4 x 8 — 160
	National "C"	10200 ft./sec.	1 1/4 x 8 — 225
Medium Speed	National "D"	7900 ft./sec.	1 1/4 x 8 — 140
	National "E"	9100 ft./sec.	1 1/4 x 8 — 160
Low Speed	National "F"	6600 ft./sec.	1 1/4 x 8 — 230
	National "F"-1	5700 ft./sec.	1 1/4 x 8 — 250
	National "G"	5600 ft./sec.	1 1/4 x 8 — 200
	National "H"	5100 ft./sec.	1 1/4 x 8 — 180
Permissible Gelatin	Napcogel No. 1	15000 ft./sec.	1 1/4 x 8 — 103

These Powders are for Anthracite and Bituminous Mines
See our Catalog data in Coal Mining Catalogs

NATIONAL POWDER COMPANY

ELDRED (McKean County) PENNA.

MANUFACTURERS OF HIGH EXPLOSIVES FOR ALL INDUSTRIAL PURPOSES





PUBLIC ENERGY NO. 1

BITUMINOUS coal is America's No. 1 source of power and heat, so you can easily see how important it is to our successful conduct of the war.

You may be surprised to know that coal develops more power—pulls more trains—warms more homes—turns more wheels—generates more light than any other fuel, and does it at lower cost.

But the men who own and operate the mines are keenly aware of these facts—and of the responsibilities that go with them.

That is why, during the lean years of the thirties, they dug down in their pockets

to launch a modernization program. Thanks to that job, *more coal was produced in 1942 than ever before in history*, despite the loss of some 70,000 trained workers to the armed forces and other war plants.

And again in the first 7 months of 1943, America's bituminous coal industry managed to beat all previous records for a like period.

Make no mistake about it, the men who made these records are working shoulder to shoulder with all American industry, keenly aware of their obligations as citizens, as employers, and as suppliers of the fuel that is "public energy No. 1."

BACK THE ATTACK • WITH WAR BONDS

BITUMINOUS COAL
Institute

60 East 42nd Street

New York 17, N.Y.

*As the percentage of
mining increases*



*— so does
the use of*



AMERICAN EXPLOSIVES

EACH year the coal tonnage from stripping operations constitutes a larger portion of combined anthracite and bituminous production. The fact that this industry uses an ever-increasing percentage of AMERICAN explosives is significant since the removal of overburden and the blasting of coal — through varying conditions — demand explosives particularly fitted to this work.

AMERICAN explosives and blasting supplies are the products of intensive research, chemical control, inspection and unrelenting care in manufacture.

• Capable field engineers are available at your call.

- * **HIGH EXPLOSIVES**
 - * **PERMISSIBLES**
 - * **BLASTING POWDER**
 - * **BLASTING**
- ACCESSORIES**

American Cyanamid & Chemical Corporation



A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

EXPLOSIVES DEPARTMENT

SALES OFFICES: Pittsburgh, Pa. Bluefield, West Va. Scranton, Pa. St. Louis, Mo. Chicago, Ill.
Pottsville, Pa. Hazleton, Pa. Maynard, Mass.

IT'S A PRODUCTION

COAL MUST BE MINED

Coal is one of the raw materials upon which depends much of our existence. Coal is vital — it is power. Coal is the energy behind our war plants, the steel mills and the shipyards — the force behind those tanks, planes, ships, jeeps, trucks and ammunition. Yes — it takes COAL to win a war.

In this country we are fortunate in having this essential and vital resource at our command — fortunate in knowing how to use it advantageously.

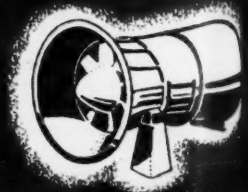
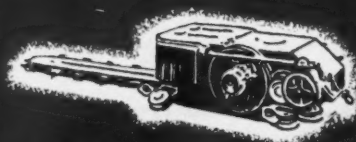
Coal must be mined. It's our job here at Jeffrey to build mining machinery to help do just that. A complete line of modern units for every phase of mechanized mining operations from face to railroad car — and on beyond. We are sincere in our endeavor to help you meet the No. 1 production task of the coal industry. Jeffrey continues to serve in the fight for freedom — to help coal win the victory.

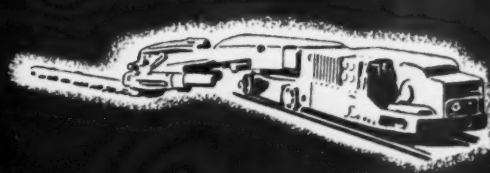
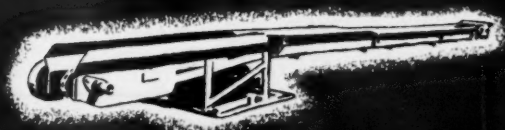
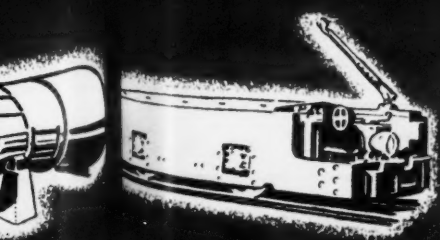
THE JEFFREY MANUFACTURING COMPANY

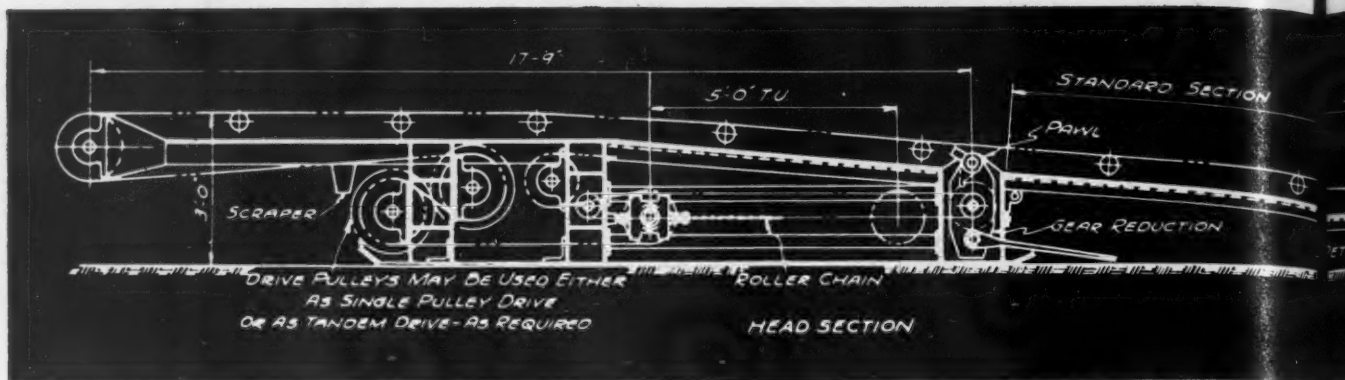
Established in 1877

912-99 NORTH FOURTH STREET • COLUMBUS 16, OHIO

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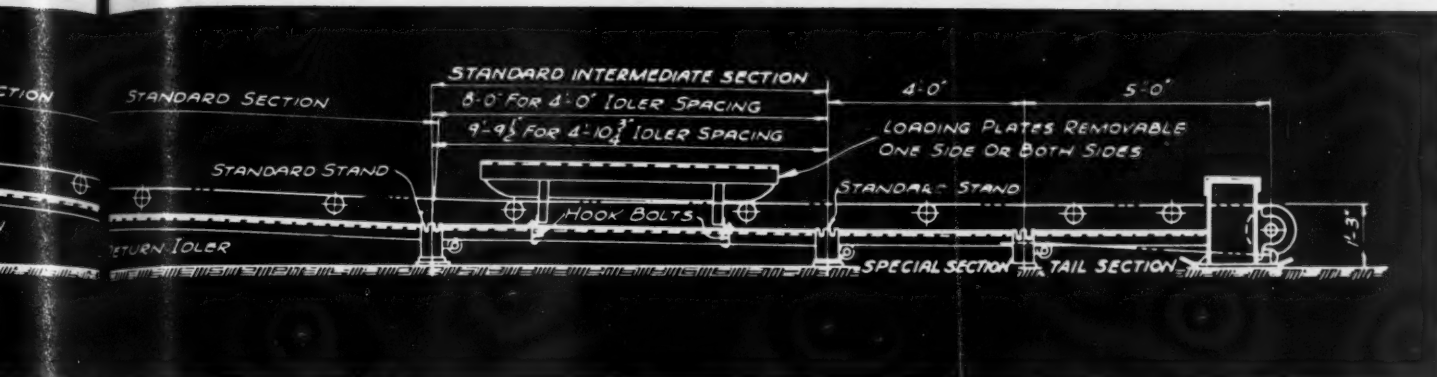


A MINE CONVEYOR

**HANDLING UP TO 300 TPH
OVER LENGTHS AS GREAT
AS 3000 FT.**

*with a belt line only
15" above the floor*

FOR MATERIAL AID IN



THE NEW ROBINS MINE CONVEYOR is designed and engineered to deliver a high rated capacity easily, smoothly and efficiently. It is an adaptable unit . . . so adaptable that it can be anything you want it to be anywhere you put it.

1. Made in 3 standard sizes: 24", 26" and 30" belt widths.
2. Operates normally with a single Pulley Drive but Pulley Outfits are built into the Head Section for tandem Pulley Drive.
3. Drive can be mounted on either side.
4. Also operates in reverse direction—to carry men and materials into the mine.
5. Takeup located in Head Section (no need to go to other end of Conveyor to adjust tension).
6. Takeup can be operated from either side.
7. Two types of Takeup. Ratchet-and-pawl standard; Counterweighted Gravity easily attached.
8. Takeup handles 10 feet of belt slack.
9. Special Section handles additional
- 8 ft. of belt slack—total of 18 ft. without cutting belt.
10. Pulley Outfits designed for 4-ply, 42 oz. hard duck 52# tension belt, enabling Conveyor to handle 300 tons per hour—over a 3000-foot length.
11. Idlers are 4" in diameter. Handle heavy loads over long distances without burning themselves out.
12. Return Idlers clear both floor and average amount of accumulated coal on the floor.
13. Both Troughing and Return Idlers are ball-bearing type, easily lubricated on either side.
14. Holes in Deck Plates allow attaching Guide Idlers for return belt.
15. Deck Plates in the Intermediate Sections are No. 14-gauge, supported on two angles.
16. Idler spacings either 4' or 4'-10-3/4"
17. Each Intermediate Section is jig-assembled in our shop, shipped in one piece to assure alignment in the field.
18. Entire Conveyor can be assembled, extended and moved without using tools. Intermediate Sections are dropped into slots—not bolted.
19. Drop-in feature enables Conveyor to follow contour of seam.
20. Head and Tail Sections mounted on skids for easy moving.
21. No steel work under Tail Pulley—easy to clean-out.
22. Loading Plates (standard equipment) attached to decking by hook-bolts. Can be used on either or both sides.
23. Conveyor can be fed from tail end or at any point on either side of Tail and Intermediate Sections.
24. Belt line is only 15" above the floor. Head Section only 30" high when setting-up.

The new Robins Mine Conveyor is not an experiment. It is already operating successfully in several mines. It will bring new efficiency and economy to yours. For further facts, write Dept. CA 10.

ROBINS makes: BELT CONVEYORS • COAL AND ORE BRIDGES • BUCKET ELEVATORS • CAR AND BARGE HAULS • CAR DUMPERS • CAR RETARDERS • CASTINGS • CHUTES • CONVEYOR IDLERS AND PULLEYS • CRUSHERS • FEEDERS • FOUNDRY SHAKEOUTS • GATES • GEARS • GRAB BUCKETS • PIVOTED BUCKET CONVEYORS • VIBRATING SCREENS • SCREEN CLOTH • SELF-UNLOADING BOAT MECHANISMS • SKIP HOISTS • STORAGE AND RECLAIMING MACHINES AND SYSTEMS • TAKEUPS • LOADING AND UNLOADING TOWERS • TRIPPERS • WEIGH LARRIES • WINCHES • WINDLASSES

ENGINEERS • MANUFACTURERS • ERECTORS

**ROBINS
CONVEYORS
INCORPORATED**
Founded in 1896 as Robins Conveying Belt Co.
PASSAIC • NEW JERSEY

AID IN MATERIALS HANDLING . . . It's ROBINS

MATERIALS HANDLING MACHINERY

HOW FAYETTE-JELICO Is Meeting Its War Time Demand For Maximum Production

Tonnage Hauled With S-D Automatic Mine Cars Averages 10 Tons Per Man Per Shift

Here is another in a series of typical case histories of the successful jobs S-D 1-2-3 "Automatics" are doing in leading coal mines throughout the industry.

At Fayette-Jellico Coal Co., Warren, Ky., 150 S-D "Automatics", having a height of only 17 inches and with a level full capacity of $1\frac{1}{4}$ tons, are averaging 2.4 tons per car per trip. Their average turnover is 4 trips per shift, with a haul of from $1\frac{1}{2}$ to $2\frac{1}{4}$ miles.

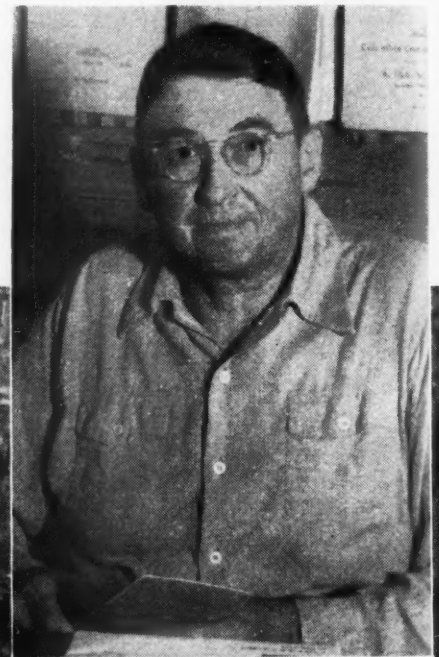
The photo at the bottom of this page shows the excellent character of coal being produced. Lump and egg are the coals Fayette-Jellico are after and they are, unquestionably, realizing the maximum percentage of large coal, because minimum breakage of coal is an outstanding feature of S-D 1-2-3 "Automatics".

Operation of Fayette-Jellico is handled under the direction of Messrs. Claude and Isaac Congleton. Mr. Claude Congleton says: "We used other types of mine cars before taking over this mine and breakage of coal was tremendous compared to our present experience with S-D 1-2-3 automatic cars. Breakage is no worry to us at all now." Mr.

Congleton states also: "Our mine cars are the least of our worries. Men loading and handling them frequently tell us they are the easiest to handle of any they have ever worked with, and this probably accounts, in a large measure, for our men doing their part on production, which at present is averaging 10 tons per man per shift." Fayette-Jellico is producing from 1200 to 1500 tons of coal per day.

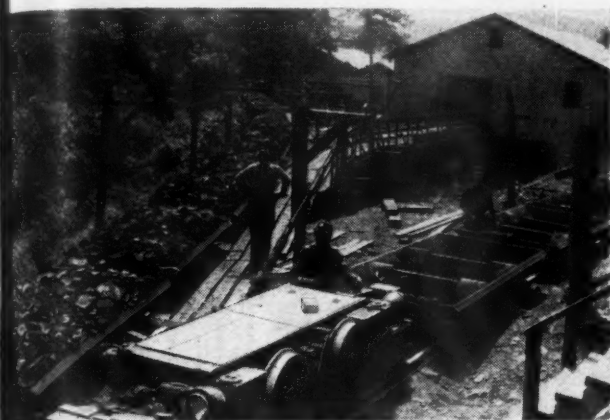
Mr. Alex Frost, Supt., says: "I've used all types of cars and practically every make in my 27 years of mining. I haven't seen one yet that can compete with S-D 1-2-3 automatic cars in tonnage output per car. Continuing, Mr. Frost states: "We couldn't possibly get our present production with any other type of car. We discharge about 100 tons of coal into the storage bin in 3 minutes and the empties are on their way back to the mine immediately. It is just as

Mr. Claude
Congleton—
Executive Man-
ager Fayette-
Jellico Coal Co.



important to keep your cars busy as it is to keep your men busy, and S-D "Automatics" permit this by eliminating standing idle trips."

These men know how to operate a mine efficiently, and it goes without saying that they would not be so outspoken and enthusiastic in their praise of S-D 1-2-3 "Automatics" if it was not justified by their experience with maximum production, conservation of manpower, and worthwhile savings, for which these cars are famous. It is operations like this



The turn-around—at the bin where cars are discharged and immediately are on their way back to mine.

and the recommendations of men like Mr. Congleton and Mr. Frost that are convincing so many other operators that the S-D 1-2-3 "Automatic" is the car for modern mining.

The modern S-D 1-2-3 Automatic Mine Car is, beyond question, the greatest aid possible to maximum production in any coal mine today. No other mine car can approach its efficiency, because the operating principles of the S-D 1-2-3 "Automatic" are not to be found in any other car.



Hopper at storage bin where coal is laid down gently through one door at a time. Coal is not dropped. Note how coal tapers off from approach to hopper.

Never before have maximum production, conservation of manpower, and low operating costs been so vital in mining. Therefore, the advantages of the S-D 1-2-3 "Automatic", in meeting all three of these requirements, become more pronounced. In meeting maximum production, because of its faster system of operation—fast automatic dumping while

Here is a portion of Fayette - Jellico's screening plant, with storage bin high above in background. An 800 ft. retarding conveyor carries coal from bin to screening plant.



in motion; in conservation of manpower, because no manual labor is required at bin. All of these, along with savings in electric power, maintenance, and investment, contribute to lowest cost of operation.

To see S-D 1-2-3 "Automatics" in operation is the sure way to learn quickly why so many leading mines are changing over to them. You will discover too, why we are willing to rent S-D 1-2-3 "Automatics" to you on such a liberal basis that your savings will more than pay the rentals.

The need for S-D 1-2-3 "Automatics" is greater now than ever before. This is no time to be satisfied with anything but maximum production. It is a time when every ounce of manpower must be conserved. It is a time when minimum production costs are vital. This modern car will do all three for you.

All Fayette-Jellico cars are equipped with S-D "Floater" Ball Bearing Wheels. Mr. Frost says: "It is our rule to check our wheels once each year for greasing, although, with "Floaters", it has proved to be unnecessary."

Independent Engineers' tests have proved that it is possible for you to increase the pulling capacity of your locomotives by equipping your cars with S-D "Floater" Ball Bearing Wheels. Operators tell us that the power savings alone often amounts to 1½ to 2 cents per ton of coal hauled. In addition, one complete greasing in 5 years of service is usually sufficient for satisfactory service. Check this with your present grease and greasing labor cost. You may be surprised at the saving in this item alone.



Mr. Alex Frost, Supt. of Fayette - Jellico Coal Co.

Sanford-Day Iron Works
KNOXVILLE • TENNESSEE



HOW THE ENGINEER GOT A NEW BATTERY

*BUT... it is not the
saving that he values most*

free

ADVANTAGES OF THE EDISON ALKALINE BATTERIES IN MINE LOCOMOTIVES AND SHUTTLE CARS

- ★ It is durable mechanically. High strength steel construction is used in the container, grids, pole pieces, etc. The electrolyte is a preservative of steel. It requires no renewal of separators throughout its long life.
- ★ It is foolproof electrically. It may be short-circuited, over-charged, over-discharged, or even accidentally charged in the reverse direction without injury.
- ★ It can be charged rapidly. It may be charged at full normal rate throughout the entire length of charge. It requires no equalizing.
- ★ It withstands temperature extremes. It is not damaged by freezing. Free air spaces on all sides of all cells provide ventilation for rapid cooling under high temperature conditions.
- ★ It is free from ordinary battery troubles. It is not subject to sulphation, shedding of active material, buckling of plates, jar breakage or other common causes of battery failure.
- ★ It does not require critical adjustment of charge rates. It can be charged directly from the d-c mine power supply. It has no finish-rate limitations.
- ★ It is simple to maintain. Merely charge adequately, add pure water, keep clean and dry.
- ★ Its tray assembly and cell connections are extremely simple.
- ★ Its life is so long that its annual depreciation is less than that of any other type of storage battery.

Four years ago, the Engineer of an eastern mine accumulated 90 old A8 Edison Alkaline Battery cells which were no longer of sufficient capacity for locomotive service.

Instead of scrapping these cells, he made them up into a switch control battery.

This new battery of old cells has been operating for three years, and no one can predict how many more years it will last.

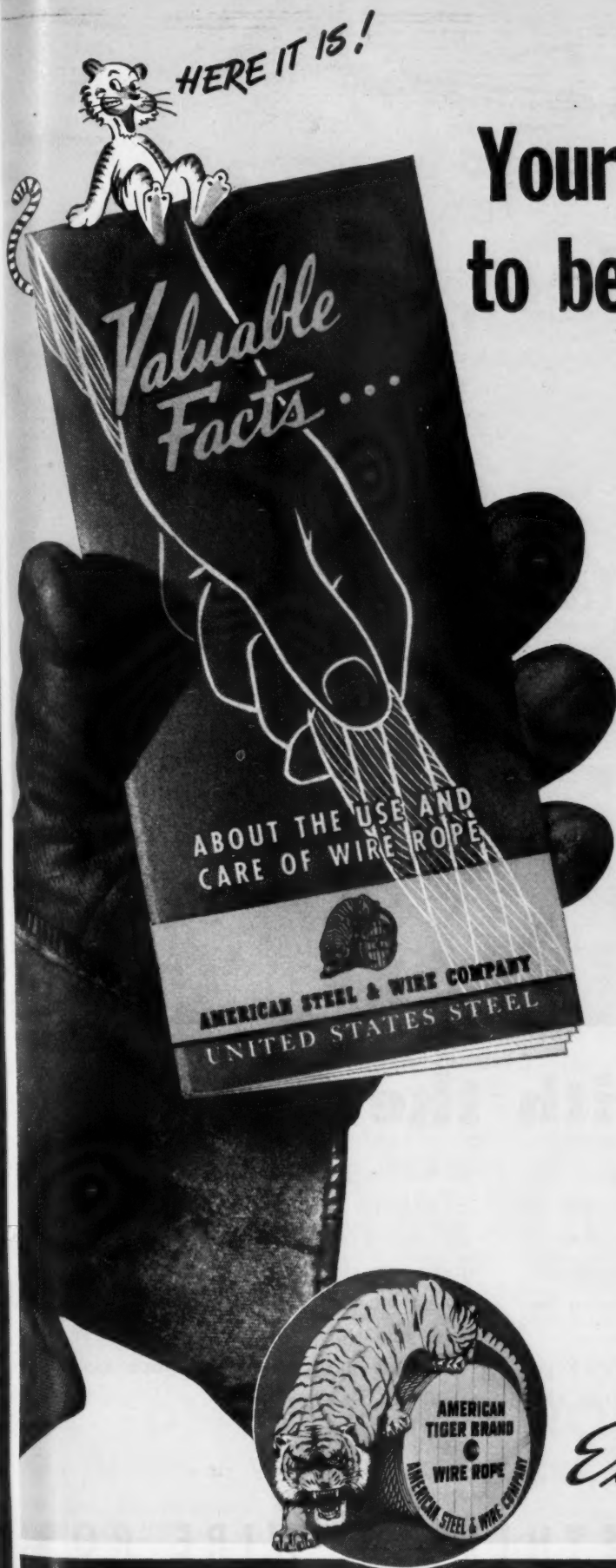
One day when there was a local power outage for eight hours, the battery not only threw the switches but carried the emergency lights as well.

The Engineer who thus saved the cost of a new battery is naturally pleased with the saving. But what he values most is that the batteries which power his locomotives are not subject to sudden or unexpected failure—having such a reserve of dependability that they can give a second life.

EDISON STORAGE BATTERY DIVISION, THOMAS A. EDISON, INCORPORATED, WEST ORANGE NEW JERSEY

Edison

ALKALINE BATTERIES



Your pocket guide to better wire rope service

HERE is a handy book you need right now. In 48 pages, packed with information, it tells you what to do to keep your wire rope operating at top efficiency and for the longest possible time.

Based on the experience of leading wire rope engineers and thousands of rope users, it offers practical suggestions on every phase of wire rope handling and care.

Subjects covered include—proper handling of ropes, attaching rope clips and sockets, splicing, lubrication, care of sheaves and drums, minimum safety factors and many other helpful facts showing how to avoid common errors that shorten rope life.

This booklet is free. Order as many copies as you need. Get them into the hands of the right men.

Send for Free Wall Chart, too.

The ten vital rules of wire rope care and handling are graphically illustrated and briefly described in this attractive wall chart. Printed in colors, on a 15" x 21" heavy cardboard mount, it can be placed for ready reference wherever wire rope is being used. Acts as a constant reminder of good wire rope operating use and practice.

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

COLUMBIA STEEL COMPANY

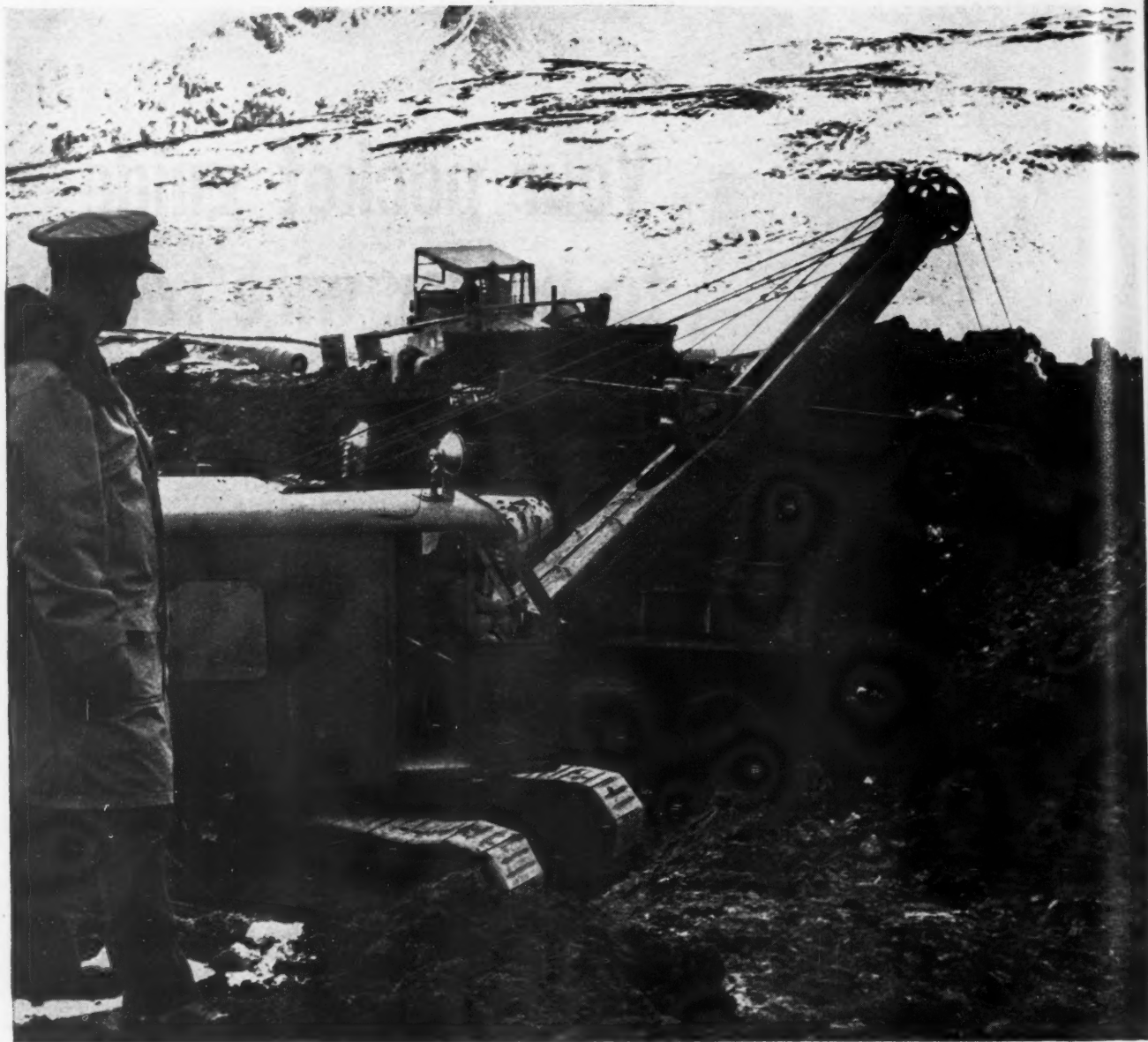
San Francisco

United States Steel Export Company, New York



Excellay Preformed

UNITED STATES STEEL



Serving with the Seabees ★

The Seabees—those tough and able men who carve airfields out of tropical islands, set up bridgeheads while enemy bombers drone overhead, and move equipment across rivers and canyons amid whining bullets—are among the foremost users of Bethlehem Wire Rope.

The Seabees are using Bethlehem Wire Rope on power shovels, cranes, hoists, dredges and

on the many other pieces of equipment used in military construction. Hundreds of tons, millions of feet, of Bethlehem Wire Rope are going into ships' rigging, truck-winch cables, towing hawsers, Navy-yard dredges, mines, oil fields and war-plants. We are doing our best to produce more rope, better rope, faster.



★ ★

★ ★ BETHLEHEM WIRE ROPE

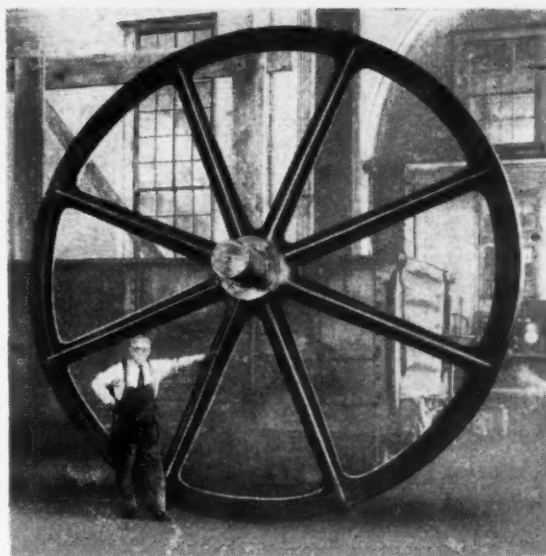
Vulcan Allcasteel Sheaves mounted on anti-friction bearings at property of Locust Coal Co., near Shenandoah, Penna.



Vulcan "ALLCASTEEL" Sheaves Prolong the Working Life of Wire Rope

Cast in one piece in our own steel foundry Vulcan Allcasteel Sheaves are accurately machined AFTER heat-treating to assure perfect operating alignment. Besides being extremely tough and strong they are so highly resistant to rope wear that the groove maintains its original correct shape indefinitely—thereby eliminating the destructive grinding and pinching of wire rope so often caused by worn sheaves, and greatly prolonging its useful life.

Widely used, for more than twenty years, by leading mining companies throughout the United States and many other countries Vulcan Allcasteel Sheaves have thoroughly proved their superiority for every type of heavy-duty service. Available in any size, for vertical or horizontal mounting, with either plain or anti-friction bearings. Write us regarding any present or prospective requirements.



One of the six 14 ft. diam. Vulcan Allcasteel Sheaves recently furnished to a large metal-mining company.

VULCAN IRON WORKS

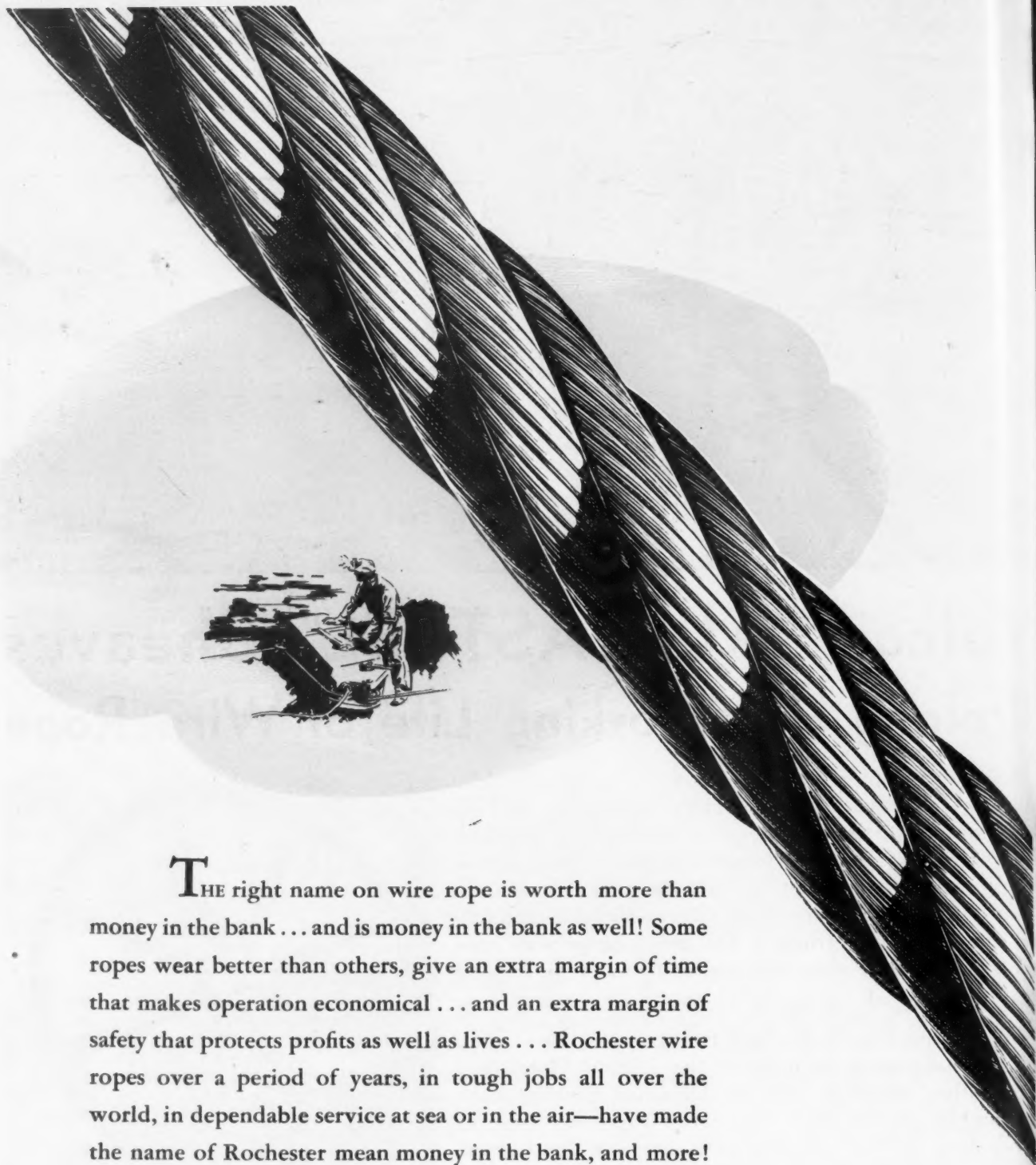
Main Office and Works WILKES-BARRE, PA., New York Office 50 Church St.

Heavy-Duty Electric Hoists
Self-Contained Hoists
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Room Hoists

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Steam Locomotives
Diesel Locomotives
geared and electric drive
Gasoline Locomotives
geared and electric drive

Load-Carrying Larries
Rotary Kilns, Coolers and Dryers
Crushers and Pulverizers
Briquetting Machines
Ball, Rod and Tube Mills



THE right name on wire rope is worth more than money in the bank . . . and is money in the bank as well! Some ropes wear better than others, give an extra margin of time that makes operation economical . . . and an extra margin of safety that protects profits as well as lives . . . Rochester wire ropes over a period of years, in tough jobs all over the world, in dependable service at sea or in the air—have made the name of Rochester mean money in the bank, and more! . . . Present production is entirely restricted to government services and high priority industries. But afterwards when you can have both wire rope and free choice, remember Rochester when you want the best!



ROCHESTER *Ropes*
CULPEPER, VIRGINIA

...it's the

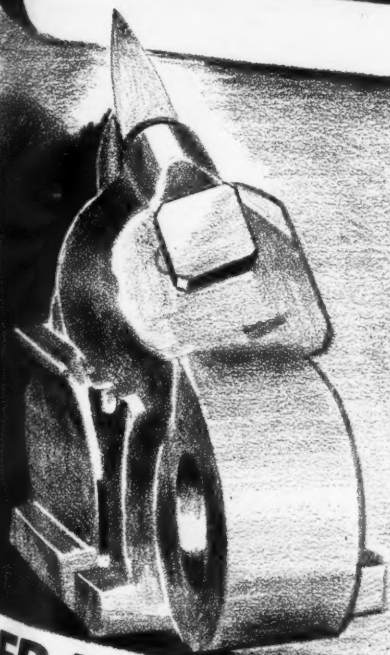
TEETH

that count



"COAL TEETH" — the Prox alloy tool steel precision hardened double point bits — put more bite in any mining machine.

If a mining machine cutting ten places per shift with mine-sharpened bits can get 11 places with precision hardened factory bits, those factory bits have not only cost nothing but yielded a handsome profit. One Illinois mine raised their shift average from 18 places to 28 places.



FRANK PROX COMPANY
INCORPORATED

TERRE HAUTE, INDIAN
1205 SOUTH FIRST STREET



keys to higher Tonnage

With increasing dependence on electrically-powered mining equipment, well-planned electrical systems become the key to high productivity. Slower-operating machinery—Breakdowns caused by overheated motors and equipment—Increased power costs—all result from poor power conditions.

HERE'S A SEVEN-FOLD PLAN* TO ENSURE EFFECTIVE, ECONOMICAL VOLTAGE AT THE WORKING FACE:

1. Keep substations as close as possible to the working face.

Good rules are: 275-volt D.C. substations within 2,500 feet of the farthest working face; 240-volt units within 600 feet. Portable substations will aid in achieving this goal.

2. Bond all tracks, and keep every bond in good condition.

For short-lived tracks use quickly reclaimable bonds or other modern methods. For permanent tracks, welding is an excellent alternative to bonding.

3. Use ample feeder capacity, and run feeders to the necks of the farthest rooms.

In most D.C. systems with stationary substations, the minimum feeder size along the mains should be not less than 1,000,000 C.M., and not less than 500,000 C.M. on the room entries. Where substations are portable, the size should be not less than 500,000 C.M. for both applications. An assortment of cutting room-entry feeders in 50- to 200-foot lengths fitted with quick-connection terminals will facilitate installation whenever needed.

4. Install auxiliary returns along main lines and in room entries to balance circuits.

This provides a degree of protection against slow-downs until broken bonds can be repaired. The auxiliary returns should be cross-connected to rails at 200- to 400-foot intervals. Cross-connections should be tested frequently with a hook-on ammeter. Current at this point usually indicates a broken bond.

5. Use conductors of proper size.

Adequate-sized conductors for trailing cables; lengths as short as possible for standard duties. Extensions should be on hand to take care of emergency or infrequent jobs.

6. Localize power interruptions.

Automatic circuit breakers and/or lines separate from the trolley for the face machinery should be used to limit power interruptions to small sections or a few units.

7. Check face power regularly with an indicating voltmeter.

*From a recent issue of *Coal Age*.

SPIRALWEAVE MINE POWER CABLE

Armored, moisture-proof and light in weight, this cable can be laid directly in a trench, run through pipe, suspended vertically in shafts and boreholes, or hung on insulators. SPIRALWEAVE — a "fire-hose" covering weatherproofed with asphaltum — means long life and added strength.



3401

Hazard engineers are ready to assist you in bringing your electrical systems up to peak operating efficiency — and Hazard cables are ready to keep it there.

HAZARD INSULATED WIRE WORKS

DIVISION OF THE OKONITE COMPANY

Works: Wilkes-Barre, Pennsylvania

Offices in Principal Cities

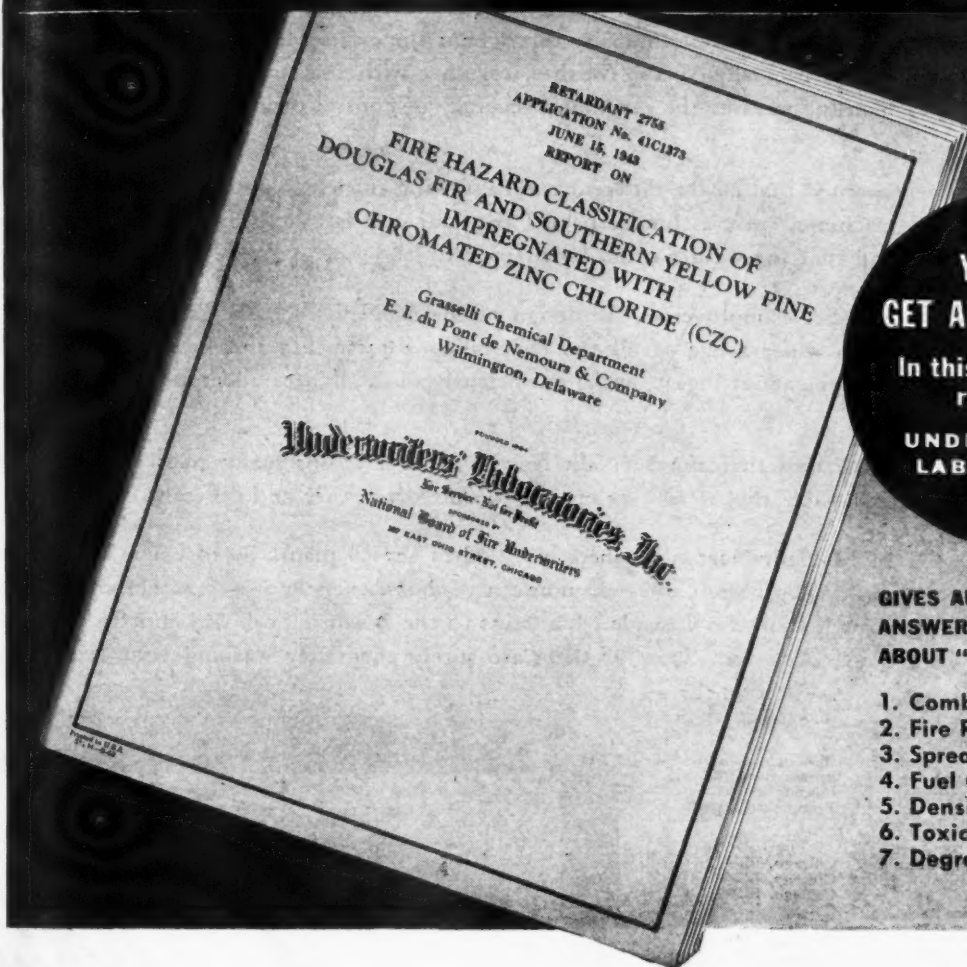


HAZARD



Insulated wires and cables for every mining use

REPORT ON THE FIRE RESISTANCE OF "CZC"-TREATED WOOD



**YOU CAN
GET ALL THE FACTS**

In this new 64-page
release by

**UNDERWRITERS'
LABORATORIES
INC.**

**GIVES AUTHORITATIVE
ANSWERS TO QUESTIONS
ABOUT "CZC"-TREATED WOOD:**

1. Combustibility
2. Fire Retardant Ratings
3. Spread of Fire
4. Fuel Contributed
5. Density of Smoke
6. Toxicity of Fumes
7. Degree of Permanence

THIS authentic technical report from Underwriters' Laboratories, Inc., supplies the facts you have asked for. It gives detailed information on the relative degree of protection given by varying amounts of Chromated Zinc Chloride

in treated lumber. Use the coupon below or write today for your Report on the fire resistance of "CZC"-treated wood. E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington, Delaware.



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WOOD PRESERVATIVE

USE THIS VALUABLE COUPON TODAY

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Grasselli Chemicals Department
2504 Nemours Bldg., Wilmington 98, Delaware

Please send me the Underwriters' Laboratories, Inc., report on "CZC"-treated wood.

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ADDRESS _____

CITY _____ STATE _____

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

QUESTION: 1

ANSWER:

Tune in for the answers! They are straight from the shoulder and in the language of mine superintendents. These very same questions may have bobbed up in your mind. If you want further specific information on how to proceed with plans for your mine, write to us.

How do I know the McNally-Norton Washer has an adjustment which will adapt to our coal?

The most important and sensitive adjustment of any impulse washer is the rate of change of pulsation intensity throughout the cycle. The patented lowered air chest of the McNally-Norton Washer, together with the submerged air receiver, enormously increases the range and accuracy of control of impulse.

★ ★ ★

QUESTION: 2

ANSWER:

Granted that all the different coals are being efficiently washed by McNally-Norton machines, what assurance have I that our coal is exactly like any of these others and that the washer could be adapted to it?

Successive improvement in design of the McNally-Norton Washer has resulted in much wider range of all the controlling adjustments and increased precision of adjustment settings to make it efficiently wash all sizes and types of coal.

★ ★ ★

QUESTION: 3

ANSWER:

Admitting that the McNally-Norton Washer cleans many coals effectively, isn't it possible that it may be entirely unsuited to other and different coals?

91 McNally-Norton Washers installed in the 49 plants listed below are efficiently washing both shaft and strip mine coal of almost every known type. These installations stretch from the Cascade Mountains to the Atlantic Seaboard and from Alaska to South America. Some of them are surely effectively washing your type of coal.

COMPANY	MINE	HEADQUARTERS
Alabama By-Products Corp.	(Alabama)	Birmingham, Ala.
Montivallo Coal Mining Co.	Barney Mine	Birmingham, Ala.
(a) Sloss Sheffield Steel & Iron Co.	Montivallo	Birmingham, Ala.
(b) Sloss Sheffield Steel & Iron Co.	Bessie Mine	Birmingham, Ala.
	Flat Top Mine	
Bankston Creek Collieries "Sahara Coal"	(Illinois)	Chicago, Ill.
Delta Coal Mining Co.	Nos. 4, 5, 6, and 16 Mines	Chicago, Ill.
Old Ben Coal Corp. (In constr.)	Delta Mine	Chicago, Ill.
Peabody Coal Co.	Mine No. 15	Chicago, Ill.
Pyramid Coal Corp.	Mine No. 14	Chicago, Ill.
St. Louis Coal Co.	Pyramid	Chicago, Ill.
St. Louis & O'Fallon Coal Co.	Florida	St. Louis, Mo.
Southwestern Ill. Coal Corp.	Black Eagle No. 2	St. Louis, Mo.
Truax-Traer Coal Co.	Streamline	Percy, Ill.
Truax-Traer Coal Co.	Fiatt	Chicago, Ill.
Fairview Collieries Co.	Forsythe	Chicago, Ill.
Gulf, Mobile & Ohio R. R. Co.	Fairview	Indianapolis, Ind.
Morgan Coal Co.	Dobbs	St. Louis, Mo.
Dering Coal Co.	Bryant	Indianapolis, Ind.
	Eldorado	Chicago, Ill.
Ayrshire Potaka Collieries Corp.	(Indiana)	Indianapolis, Ind.
Linton Summit Coal Co.	Chinook	Terre Haute, Ind.
Maumee Collieries Co.	New Hope	Terre Haute, Ind.
Sunlight Coal Co.	No. 23 & No. 24	Chicago, Ill.
Tecumseh Coal Corp.	Sunlight No. 11	Chicago, Ill.
Pyramid Coal Corp.	Dickeyville	Chicago, Ill.
	Victory	
Alston Coal Co.	(Kansas)	Pittsburg, Kan.
Commercial Fuel Co.	Alston Mine	Pittsburg, Kan.
Kelly-Carter Coal Co.	No. 2	Pittsburg, Kan.
Pioneer Coal Co.	Kelly-Carter	Pittsburg, Kan.
Pittsburg & Midway Coal Mining Co.	Pioneer	Pittsburg, Kan.
Sentry Coal Mining Co.	No. 15	Pittsburg, Kan.
	(Kentucky)	Madisonville, Ky.
State University of Iowa	Sentry	
	(Iowa)	Iowa City, Ia.
Binkley Mining Co. of Mo.	(Missouri)	Chicago, Ill.
Crowe Coal Co.	Bee-Veer	Kansas City, Mo.
Marriott Reid Coal Co.	Reliance	Columbia, Mo.
Huntsville-Sinclair Mining Co.	Columbia	Kansas City, Mo.
Windsor Coal Co.	Mark Twain	Pittsburg, Kan.
Hume Sinclair Mining Co.	Windsor	Kansas City, Mo.
	Hume	
Youghiogheny & Ohio Coal Co.	(Ohio)	Cleveland, O.
Hanna Coal Co. of Ohio	Peacock	St. Clairsville, O.
	Willow Grove No. 10	
Butler Consolidated Coal Co.	(Pennsylvania)	Wildwood, Pa.
Rochester & Pittsburgh Coal Co.	Wildwood	Indiana, Pa.
	McIntyre	
United States Fuel Co.	(Utah)	Salt Lake City, Ut.
	King Mine	
Virginia Polytechnic Institute	(Virginia)	Blackburg, Va.

The Miner asks this

Roslyn Cascade Coal Co.	(Washington)	Roslyn, Wash.
U. S. Bureau of Mines	Ronald No. 1	Seattle, Wash.
Alaska R. R.	(Alaska)	Anchorage, Alaska
	Esk Mine	
Consorcio Administrador de Empresas de Mineracao	(South America)	Rio de Janeiro, Br.
Companhia Siderurgica Nacional	Soa Jeronymo Mine No. 5	Rio de Janeiro, Br.
	Tubarao	
Gulf Smokeless Coal Co.	(West Virginia)	Tama, W. Va.
Kelley's Creek Colliery Co.	Wyco	Maidsville, W. Va.
C. H. Mead Coal Co.	Maidsville	Beckley, W. Va.
New River & Pocahontas Consolidated Coal Co.	East Gulf	
Scotia Coal & Coke Co.	Havaco	Havaco, W. Va.
University of W. Virginia	Brooklyn	Slab Fork, W. Va.
		Morgantown, W. Va.

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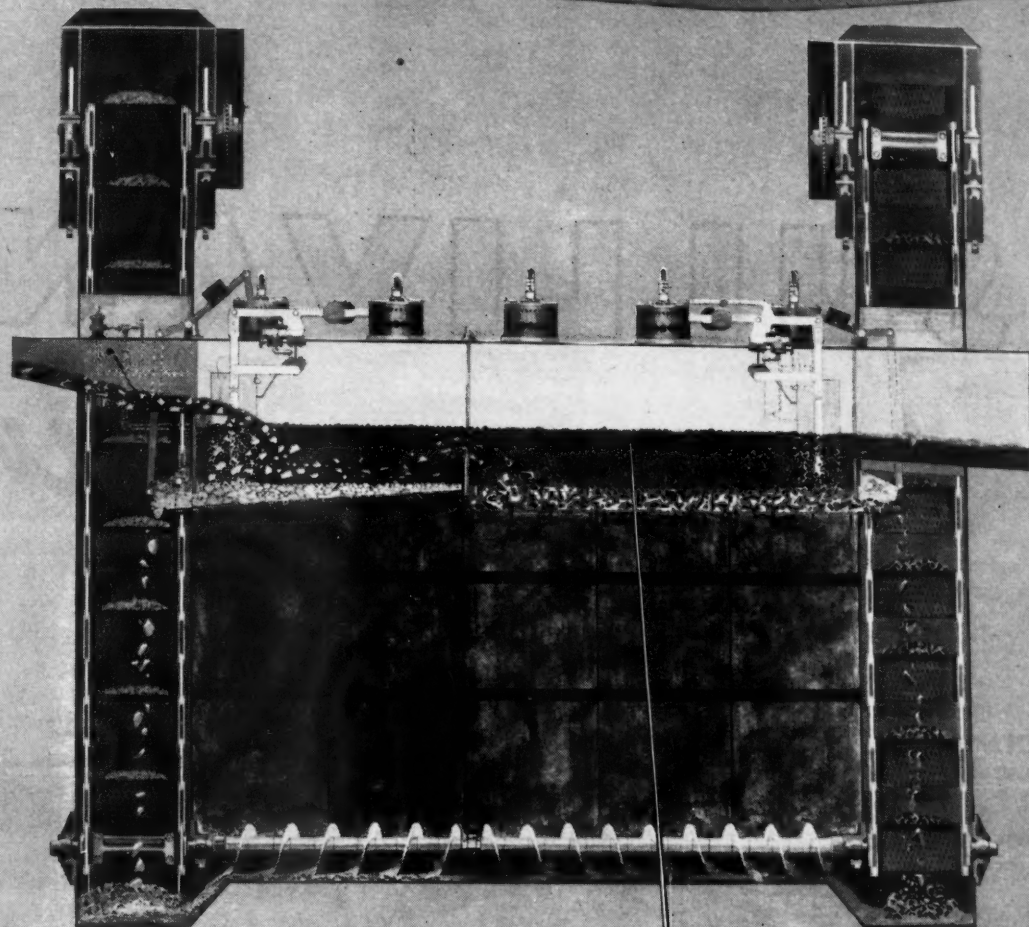
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*Min Super
the 64 Questions!*



McNALLY & PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

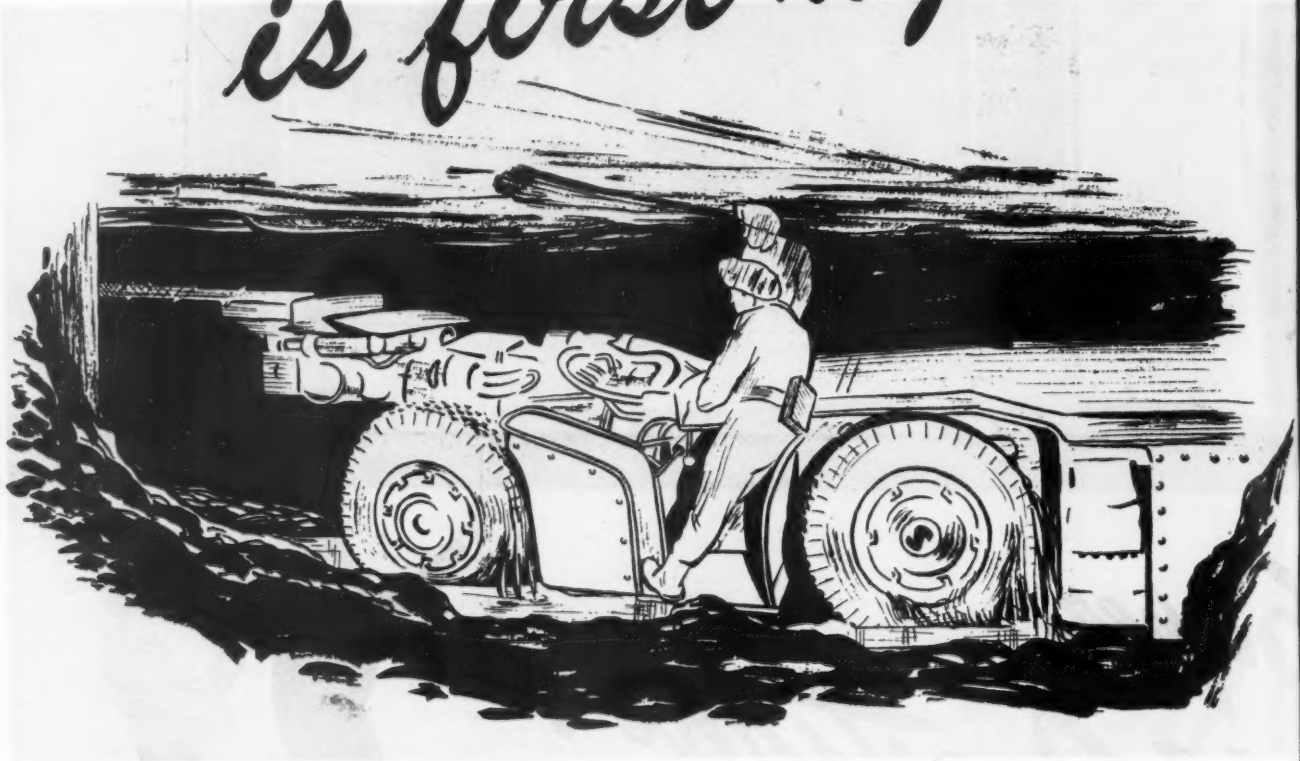
McNALLY PITTSBURG MANUFACTURING CORPORATION
Pittsburg, Kansas 307 N. Michigan Ave., Chicago 1, Ill.

Koppers Bldg., Pittsburgh 19, Pa.

Caixa Postal 1310, Rio de Janeiro, Brazil

SULLIVAN

is first again!



the **IO-RU**

TRACKLESS COAL CUTTER

SULLIVAN MACHINERY COMPANY
307 NORTH MICHIGAN AVENUE
CHICAGO

PRESIDENT'S OFFICE

POST WAR MINING - POST WAR PLANNING

To the Coal Mining Industry:-
Dear Sirs:

Convinced that trackless mining called for specialized cutting machines, we decided that instead of adapting or converting existing models we should start from the grass roots to develop a complete new machine mounted on rubber tires.

The "pilot" unit was completed in August 1942. Knowing that factory tests, no matter how severe, are inconclusive until confirmed by many months of actually cutting coal, we arranged to have this first unit put to work in a number of mines under a variety of conditions. The unit has now been cutting coal for 14 months. It has won the endorsement of mining men who have watched it. Frankly we are delighted with it.

It is unorthodox for us to mention this new machine and in the same breath announce that it is not on the market, not for sale and not for demonstration, because, like the coal mining companies, we are straining every ounce of energy to produce what the war calls for today. However as you coal operators are quietly working on your post war programs and in many cases these programs contemplate trackless mining, it is only fair you should know that Sullivan will have a proved and tested Universal, Trackless Coal Cutter . . . ready for distribution after the war.

To those of us who are manufacturers of mining machinery there is no greater satisfaction or reward than the knowledge that we have contributed tangibly to the art or economy of mining. In our 92 years of corporate existence Sullivan employees have had the stimulation of pioneering the use of mechanical coal cutting in the United States and in every coal producing country in the world. We hope we have rung the bell again with the 10-RU Trackless Coal Cutter.

Very truly yours

SULLIVAN MACHINERY COMPANY

F.W. Copeland
F.W. Copeland President



WALTER TRACTOR TRUCKS

*will Pull you
"Out of the Hole!"*

LIMITATIONS in hauling equipment have put many a strip mine operator "in the hole" trying to meet war tonnage demands. Walter Tractor Trucks will pull you out of the hole because they get the coal out of the pit—regardless of steep grades, difficult running conditions or adverse weather.

Hauling up to 50 ton payloads at good speeds, over country where other units crawl or fail, Walter Tractor Trucks move more tons—make more trips per day from pit to tipple. Specially built for off-the-road work, Walter

Tractor Trucks make it profitable to strip in territory once considered prohibitive.

The reason is found in the enormous power-plus-traction of the Walter Four-Point Positive Drive. Three patented Automatic Locking Differentials proportion the power to the FOUR driving wheels according to the traction of each wheel at any instant. Other features of value for strip mine hauling are the Tractor Type Transmission, Suspended Double Reduction Drive, scientifically distributed weight, short wheelbase and power brakes. Write for the complete details today.

WALTER MOTOR TRUCK COMPANY

1001 - 19 IRVING AVENUE
RIDGEWOOD, QUEENS, LONG ISLAND, N. Y.

Working and Saving Keep Them Waving



THREE TIMES WON FOR EXCELLENCE IN WAR PRODUCTION

Richard Kauzlaurich, husky machine operator, topped the winners in 14 other departments with a work record average of 10 hours and 48 minutes nightly since the first of the year. To him went the honor of hoisting the Navy E flag awarded for the third time to the employees and management of the Union Wire Rope Corporation. To him (and his 3 year old son, Richard, Jr.,) went the congratulations of Rear Admiral Alex M. Charlton, U.S.N., Inspector of Navy Material, Chicago.

In praising the company's production record, Rear Admiral Charlton said the wire rope it has made for the Navy in recent months would stretch from the Union Wire Rope plant to Guadalcanal, take a hitch around a palm tree and extend on to Australia.

Union Wire rope employees are pledged to save to keep the Treasury Minute Man burgee flying. The men and women of Union Wire Rope are also working day and night to produce wire rope so vital to winning the war.

● To Help All Industry... SAVE Wire Rope... Keep It WORKING...

Your wire rope still faces a tough assignment. It must continue to work overtime, often under overload, with chances of replacement limited.

Why? Because modern warfare is dependent upon wire rope to hoist, handle, load and unload vast tonnages of war materials.

To help you save wire rope and keep it working, we offer free for the asking, 5 booklets, entitled:

5 BOOKLETS
FREE!

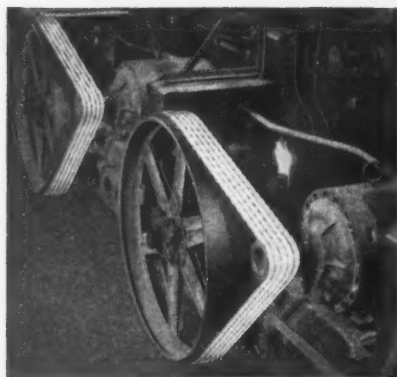


Handling of Wire Rope, 4. Lubrication of Wire Rope. These give you specialized information. **Rope Dope (5)** amplifies on abuses of wire rope and their remedies. All are written in non-technical terms. Put into practice, the information these booklets contain will stand you in good stead now and post-war.

UNION WIRE ROPE CORPORATION
2130 MANCHESTER AVE. KANSAS CITY 3, MO.

union Wire Rope corporation

Which of these
GATES V-Belts
 Best Fits *YOUR* Needs?



- Steel Cable Belts?
- Rayon Cord Belts?
- Cotton Cord Belts?
- Static Reducing Belts?
- Belts of *Special* Synthetic Rubber?

Phone Your Gates Field Engineer— *He Will TELL You!*

Whenever a drive in your plant gives you even the slightest trouble, it is a good plan to phone the Gates Field Engineer. He is a specialist who makes a business of improving drive operation.

For example, it quite frequently happens that one or more drives in a plant will wear out belts faster than seems warranted. In most cases a slight correction in groove angle, an adjustment in tension or, at most, a minor change in drive design will correct the difficulty and save money not only in belt wear but also in increased efficiency of the machine.

At times, however, the service conditions are such that a V-belt of special construction can most profitably be used. Your Gates Field Engineer will know—and he can supply a Gates V-belt that is precisely engineered to meet the unusual conditions.

The Gates V-belt of special synthetic rubber is a case in point. During the past five years, Gates has supplied industry with thousands upon thousands of these belts. Under severe conditions of heat and oil, the Gates special synthetic belt actually outwears any natural rubber belt by as much as 230%.

In your particular application, V-belts whose tension members are composed of flexible steel cables—or of rayon cords—may prove to be the most efficient and economical. Static-reducing V-belts may best fit your special need.

In any case, the wisest move you can make is to phone the Gates Field Engineer. He is thoroughly competent to analyze any drive problem. He is completely informed on the nature and advantages of every type of belt. He will always recommend the practice that will be most efficient and economical for you.

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

4310

GATES VULCO ROPE DRIVES

CHICAGO, ILL.
549 West Washington

NEW YORK CITY
215-219 Fourth Avenue

ATLANTA, GA.
738 C & S National Bank Building

LOS ANGELES, CAL.
2240 East Washington Boulevard

DENVER, COLO.
999 South Broadway

DALLAS, TEXAS
2213 Griffin Street

PORTLAND, ORE.
333 N. W. 5th Avenue

SAN FRANCISCO, CAL.
1090 Bryant Street

CARDOX

"THE NON-EXPLOSIVE MINING METHOD"

MAKES

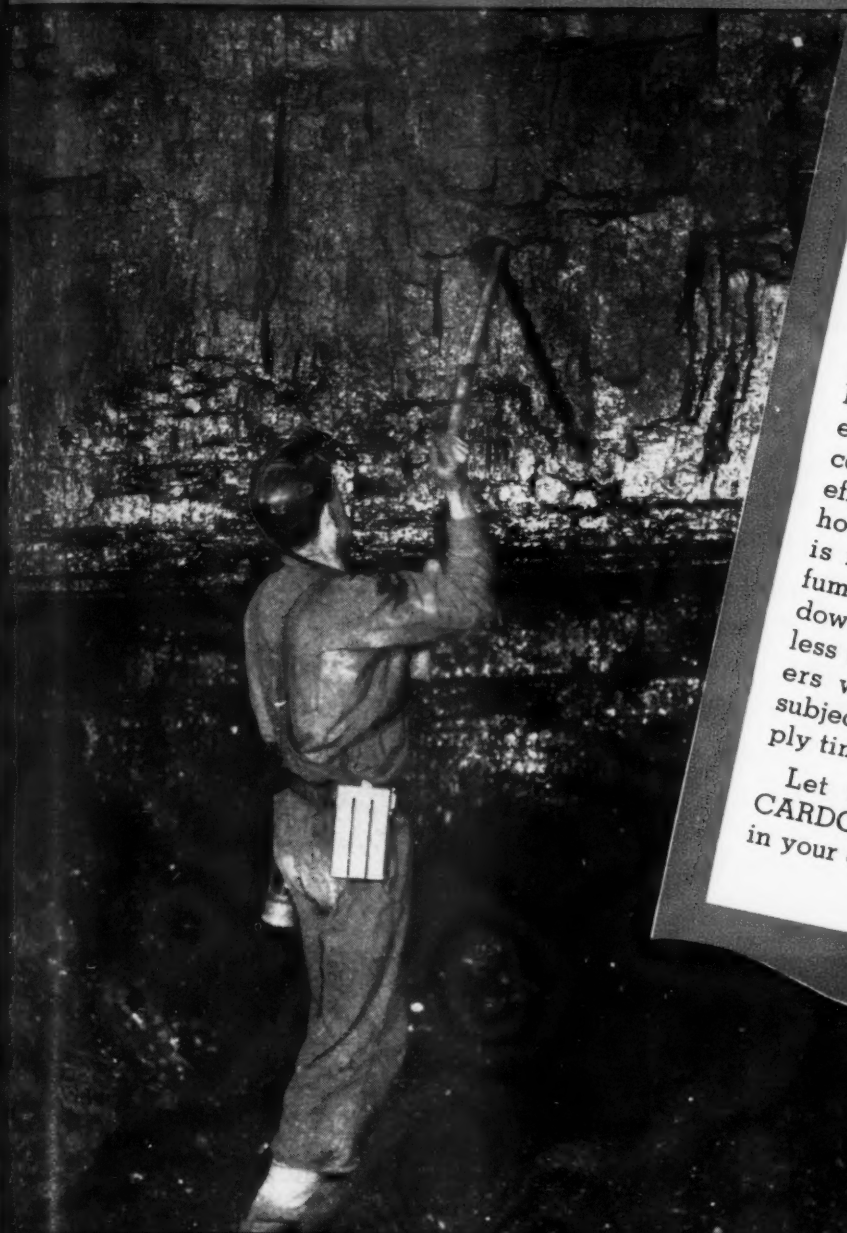
Increased Tonnage
POSSIBLE

**IN THE FACE OF
WARTIME DIFFICULTIES**

● The battle to increase tonnage in spite of the growing shortage of experienced men and deterioration of equipment will be easier to win if your coal is dislodged with CARDOX.

CARDOX is safer to store, transport, handle and use. The extra forward roll of CARDOX-mined coal permits the use of longer cutter bars, produces easily loadable falls of coarse coal that permit peak loading efficiency. Man and equipment hours are saved because there is no waiting for smoke and fumes to clear. As coal brought down with CARDOX requires less digging, mechanical loaders work faster and are not subjected to abuses that multiply time-wasting repairs.

Let us demonstrate these CARDOX advantages by a test in your own mine.



CARDOX CORPORATION • Bell Building • Chicago 1 •

WORN CABLES

If You Can't Replace 'Em—
You CAN RE-NEW 'Em

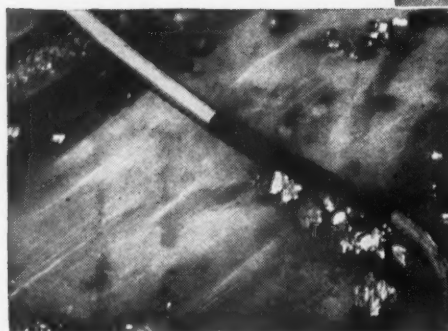


**Only RU-BER-OLD
INSULATING TAPE
has all these 7 features**

- 1 Double grip...both sides adhesive
- 2 Great tensile strength... tough
- 3 Won't tear, ravel or pucker
- 4 Resists abrasion
- 5 Acid- and alkali-proof
- 6 Extra thick...one layer insulates
- 7 Exceeds A.S.T.M. specifications by 300% in adhesiveness, 26% in tensile strength, 290% in dielectric strength

OTHER RU-BER-OLD PRODUCTS FOR COLLIERIES

ROLL ROOFING & SHINGLES
INSULATING PAINTS
BUILT-UP ROOFS
ASBESTOS INSULATIONS
ASBESTOS AND MAGNESIA
PIPE COVERINGS
ROOF COATINGS & PLASTIC
CORRUGATED ASBESTOS-CEMENT
ROOFING AND SIDING
STONEWALL BOARD



IN 1943 the slogan of the WPB is—"Patch it up and make it last." That's the big war job that's made to order for tough, double-grip Ruberoid Insulating Tape. Nothing like it for safe, fast, tight splicing and insulating.

Forget your cable worries. Ruberoid Insulating Tape does more than a patch-up job. You can treat it rough. It's made to "take it"—even when yanked over sharp coal—through oil and water—in any temperature.

To make your cable last—to prevent power losses—to save time and expense—depend upon this best known of all insulating tapes. To make sure that you have it—get your order in to your mine supply house today.

RU-BER-OLD INSULATING TAPE

The RUBEROID Co., EXECUTIVE OFFICES: 500 FIFTH AVENUE, NEW YORK

HAZARD LAY-SET

Preformed **REWARDS YOU BY—**

*One of these
invariably
justifies its
specification*

- 1 LASTING LONGER
- 2 BEING SAFER TO HANDLE
- 3 SPOOLING BETTER
- 4 RESISTING BENDING FATIGUE LONGER
- 5 REFUSING TO "PORCUPINE"
- 6 MAKING LANG-LAY MORE SERVICEABLE
- 7 BEING FREE OF TENDENCIES TO KINK
- 8 REQUIRING NO SEIZING WHEN CUT
- 9 BEING FASTER TO INSTALL
- 10 GIVING YOU GREATER DOLLAR VALUE

In Hazard **LAY-SET** Preformed wire rope there are no internal stresses to cause the rope on a drum to climb over or roll away from an adjacent wrap of rope. The resistance that **LAY-SET** has to whipping also contributes to good spooling. **LAY-SET** spools uniformly even under light load and at high speed. This increases its life by avoiding the nicking, scarfing and crushing that take such a severe toll of many wire ropes on the drum. Specify Hazard **LAY-SET** Preformed for all its built-in advantages.

HAZARD WIRE ROPE DIVISION Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Tacoma
AMERICAN CHAIN & CABLE COMPANY, Inc., BRIDGEPORT, CONNECTICUT



HAZARD LAY-SET *Preformed* **WIRE ROPE**

It's like a letter from home-



EWING GALLOWAY PHOTO

**Putting JOY EQUIPMENT into a mine today
is like a letter from home to the men who
wrestle with peak load production problems**

JOY Loaders and JOY Shuttle Cars have proved their worth, time and time again, in all sorts of mines and under many adverse conditions. An experienced JOY Engineer will be glad to confer with you, at your convenience.

day
who
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their
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ineer
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JOY Loaders handle coal *fast*—
very fast—but very gently, too.

JOY Shuttle Cars offer fast, de-
pendable haulage with amaz-
ing adroitness and mobility.



*Call in a
Joy Engineer*

JOY
MANUFACTURING COMPANY
FRANKLIN, PA.



Your name is spelled "V"! with a V!

JAVANESE . . . We didn't know you very well. We used your rubber . . . we nicknamed our coffee "Java" . . . and the newsreels showed us the beauties of city and jungle in your far-eastern island. But now that your paradise is in the clutches of the black-hearted Japs, we realize that your love of liberty is as real as our own.

That "V" in your name is a symbol of Victory . . . the Victory which we and our allies will help you win. We're working toward it now in mill and factory . . . and in mine and quarry. In mines where coal and ore and stone are blasted out of the earth. For such key men our own skilled workers are producing essential equipment—Ensign-Bickford Safety Fuse and Primacord-Bickford Detonating Fuse—to hasten mining production and promote safety.

Victory Begins Underground!

THE ENSIGN-BICKFORD COMPANY
SIMSBURY, CONNECTICUT

Ensign-Bickford
Safety Fuse



COAL AGE

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

OCTOBER, 1943

RIGHT TRACK

COAL MINING has a future. That is definite. But the question is: "How good a future?" The answer depends largely on what steps the industry takes now to insure complete acceptance of its product and an ever-widening market in the years to come. The news that bituminous coal is expanding its research and tackling its public-relations problem in forthright fashion therefore is good news.

One program complements the other. Research lights the path to greater sales. Good public relations, by promoting confidence and good will, makes those sales easier. Bituminous Coal, Inc.; Bituminous Coal Research, Inc., and the corresponding agencies for anthracite are set up to accomplish just such purposes. Since research and good public relations mean real cash to every man in the industry, from stockholder to trapper boy, these agencies merit all-out industry support.

THE JOB AHEAD

NEW GOALS for coal production already are out for 1944—at least unofficially. Bituminous mines are expected to turn out 620,000,000 tons; anthracite, 65,000,000 to 68,000,000 tons. The prospect is formidable, but meeting these goals, if at all possible, is about the only alternative to severer restrictions on consumption, whether by voluntary conservation or rationing.

Where do these increased demands originate? They come, first, from an increase in the tempo of war production, although we are reaching the peak. But victory in Europe and other theaters of war also will entail supplying liberated or vanquished enemy countries, on a temporary or semi-permanent basis, with enough coal to keep their economy and especially transportation and essential services from collapsing—for military reasons if no other. The problem already has arisen with Italy and will arise with others until the normal sources of supply are restored.

Before the war, Great Britain, Germany, Poland and, to a lesser extent, a few other states, were shipping at least 5½ million and perhaps 6 million or more net tons of solid fuels monthly to other western European countries, including the Scandinavian. How much of

this total the Allies will have to supply is highly speculative, but it might easily aggregate a million tons monthly at and for some indefinite time, depending upon the course of the war and reconstruction.

The United States undoubtedly will be called upon for a substantial share of these shipments, which must come from increased output, a cut in consumption or stocks on hand. Preferable by far is an increase in output, with sane conservation as a complementary activity promising both immediate and long-term benefits. Stockpiles also might contribute a share as long as a reduction would not leave the country short in an emergency.

The job can be done if present producing capacity is preserved and utilized to the fullest extent and if maximum economy in use is achieved—and it can be done without further rationing or distribution controls. But it will require teamwork—planning for maximum productivity by management; cooperation by labor in working the necessary time and improving efficiency; and assistance from the government in preserving the working force, facilitating the acquisition of an adequate share of equipment and materials and refraining from interference which might hamper the flow of coal from the pits to the consumer.

The next twelve months will strain the nation as never before in its history, but it, and coal, can do the job that must be done for victory.

GOOD CAUSES

THE WAR goes on to victory. Until that day, however, demands for aid and comfort continue unslackened—no less than demands for the material things needed in war production and combat. The nation, therefore, has a twofold task. Cases in point are the National War Fund and iron and steel scrap drives.

Between now and Dec. 31, the National War Fund, Inc., a federation of war philanthropies, is asking at least \$125,000,000 for service to the armed forces and for United Nations and refugee relief. Also, WPB's salvage division asks for iron and steel scrap collections of at least 15,000,000 tons as a reserve to insure the continued production of vital weapons of war. Success on both fronts means an earlier victory.

Government Mining FAILS BRITAIN

The United States coal industry is meeting wartime production goals; British coal mining is not — at least so far. Why the difference? The answer, in part at least, lies in the difference between free enterprise and government interference culminating in complete state operation — a potent argument for the continuation of the American system

WHAT LESSONS do British attempts at government operation of coal mines hold for the United States? British coal mining now is at least semi-nationalized while seizure of the United States coal mines May 1 has revived the possibility of renewed pressure for nationalization in this country. Whether it is a "lively threat" or not, the fact that the government, under the terms of the War Labor Disputes Act, is rapidly returning the mines to private operation by no means removes the possibility of attempts to put coal mining permanently in the hands of the government—despite complete lack of proof that such a step would accomplish the stated objectives and volumes of evidence to the contrary.

While conferences now under way may go far toward removing the difficulties which might lead to another seizure and perhaps indefinite continuation of government operation the road ahead remains far from clear. John L. Lewis' deadline still is Oct. 31. The War Labor Board has thrown out the only wage agreement thus far to get past the negotiating stage. Present negotiations may produce a settlement, but until then the stage is set for another work stoppage which undoubt-

edly would be followed by another seizure. If a second one should occur, it might not end as quickly as the first one appears to be doing.

Both precedent and the War Labor Disputes Act provide the grounds for additional seizures. It also is possible that reasons which might look good on their face could be found for indefinite retention and perhaps, even, an attempt at complete nationalization. It is admitted that some elements in the industry itself, more by accident than design, have provided some arguments for such a step.

Some for Nationalization

Even more important, however, seizure has given the lunatic fringe a foot in the door, and conservatives in official Washington tacitly express the fear the radicals will not hesitate to use seizure as an argument for nationalization—not only of coal but of all industry based on natural resources. Whether a real attempt to put over nationalization can be expected in the near future, of course, is a matter of speculation. Certainly coal mining and other industries should be prepared to meet any such attempt with the facts.

The arguments advanced by nation-

alization advocates are many and varied, but they rest mainly on the charge that private management fails in its duty to the public. Postulating from that allegation, the nationalizationists hold that government ownership and operation conserve a natural resource, better the condition of the industry's employees and improve its service to the public. To the last usually is added the tag: "at a lower cost."

Nationalizationists paint a tempting picture. The real question is, however, "What happens when government takes over an industry, such as coal?" Is the industry's efficiency improved—as it should be? Is its service to the public improved—as it should be? To get down to a specific case, is coal mining or any other industry put in a better position to fight a war? In other words, do government ownership and operation work?

For the answers to some of these questions, Coal Age has undertaken as exhaustive a study of the situation in Great Britain as wartime restrictions on information permit. Great Britain offers the only applicable parallel—and a fairly close one. It is about the only democracy where the experiment has been made—in fact, where

Operation

IN WARTIME CRISIS

it is now in progress. Coal mining in Great Britain now is nationalized in everything but name. Supposedly, it is a wartime expedient, but at least one high-placed official is authority for the statement that it may very possibly be a permanent thing.

How has government operation worked in Great Britain? The quickest answer might be found in its production record. Whereas, in the United States, output has steadily increased to meet war-production goals, in Great Britain, except for a rise in the first full year of conflict, it has steadily declined. Perhaps measures now being taken will change the picture, but the inescapable conclusion is that the interference and restrictions to which the industry has been subjected for a long period of years left it with practically no elasticity to meet the war crisis. Even an exten-

sion of government control to approximately complete nationalization has so far failed to remedy the situation, although, having chosen this course, government, operators, miners and the public hope for the best.

British Course Parallels U. S.

British coal mining went through much the same process of liquidation following World War I as did the American industry and was subjected to much the same sort of governmental investigation, to the tune of proposals for nationalization supported by the miners and other sympathetic interests.

Beyond that point, however, the courses in the two countries diverged. In the United States, after some hard fights, coal mining was left largely alone to earn its own way under the principles of free enterprise. About

the only federal legislation to which it has been subjected were N.R.A. and the two Guffey acts, aside from measures such as the federal mine inspection act, designed to promote health and safety. N.R.A. and the Guffey acts were designed to remove obstacles from the industry's path. Beyond that they left management largely in control of the destiny of the industry and with the usual opportunity to make a profit by improving its service.

The British picture, however, is considerably different. There, coal mining has been subjected to numerous laws and governmental regulations designed not so much to remove obstacles to free enterprise as to restrict the industry or force changes in management and operation by government fiat. It is freely charged—and with some justification—that political expediency and courting the favor of

Milestones in British Coal Control

1925—Royal Commission of Inquiry appointed. Government votes subsidy to make up difference between miners' wage demands and operators' offer. Final cost, £23,000,000.

1926—Miners' walkout precipitates general strike. Commission of Inquiry reports. Proposes government ownership of coal, amalgamation of producing properties, establishment of sales agencies and certain amendments in the wage set-up. Turns down subsidy and flatly rejects nationalization.

Mining Industry Act of 1926 passed providing, among other things, for voluntary amalgamation. Permissive 8-hour law adopted.

1930—Coal Mines Act of 1930 passed, providing for organized marketing of coal by districts and setting up machinery for forcing amalgamation. Board set up to adjust disputes. Hours reduced from 8 to 7½.

1932—Marketing plans continued until 1938; 7½-hour day extended another year.

1935—Government halts activities of Coal Mines Reorganization Commission. One forced amalgamation scheme thrown out by courts.

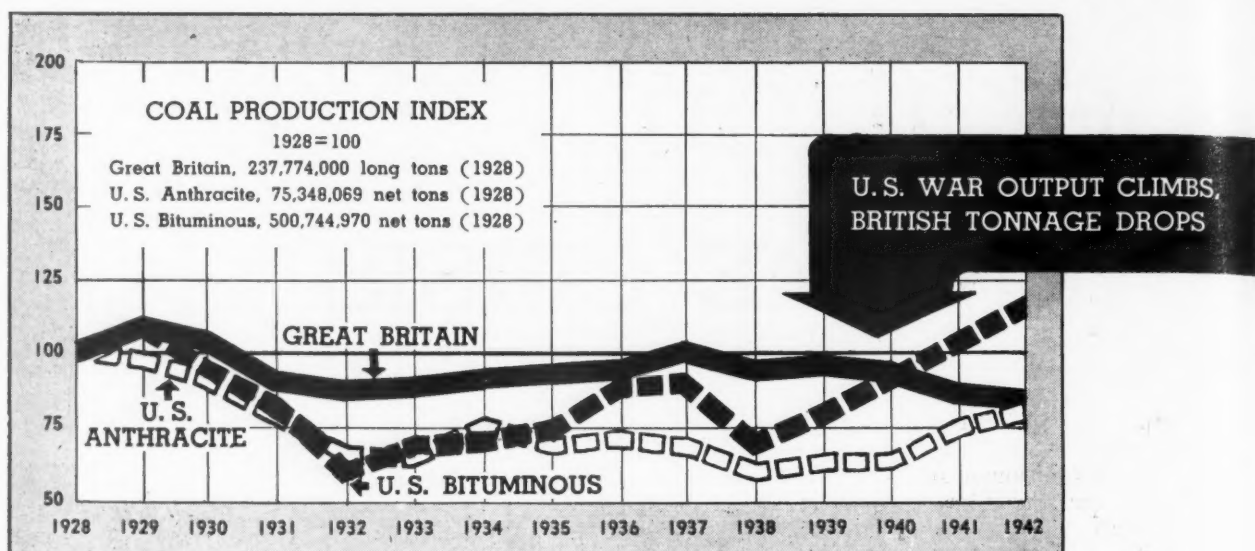
1936—Government orders owners to prepare marketing schemes eliminating inter-district competition. Coal Mines Bill of 1936, designed to revive Reorganization Commission, thrown out because appeals machinery was omitted.

1938—Coal Mines Act of 1938 passed, providing for reestablishment of Reorganization Commission and government ownership of coal at a price later fixed at £66,500,000.

1939—Great Britain declares war on the Axis.

1941—Essential Work Order adopted, freezing workers in jobs after heavy manpower losses in coal industry.

1942—Government takes title to coal reserves. Parliament, adopts White Paper putting government in complete control of the coal industry, effective June 13.



certain classes, notably labor, were the ruling factors in much of this legislation, rather than a realistic attempt to solve the industry's problems. Some measures, however, did accomplish some good, especially where they put an official O.K. on industry proposals.

The year 1925 is a good place to start tracing the history of governmental control in Great Britain. That year witnessed the granting of a subsidy to the industry to make possible a wage increase and thus prevent a general tie-up of operations by a strike. "A terrible disaster" was the way one operator termed the subsidy, and, prejudiced though he may have been, it was abandoned a year later after it had cost £23,000,000.

Another outgrowth of the 1925 imbroglio was the establishment of a Royal Commission of Inquiry, popularly known as the Samuel Commission. While the commission made some noteworthy recommendations, the constant threat of legislation kept the industry in a state of uncertainty, which pressure for nationalization and agitation by miners and their sympathizers did little to allay.

The commission's report in 1926 proposed, among other things, government ownership of coal lands, amalgamation of producing properties and the establishment of sales agencies. It came out flatly against the subsidy and against the nationalization principle put forth by the miners. It also characterized the existing wage set-up as sound, although pointing out the need for certain amendments.

The commission's work, however, was to prove of little avail when negotiations for new working agreements broke down and the miners went out, to be followed by all labor in Great

Britain. The strike and its accompanying political struggles were marked by government preparations to put the majority of the commission proposals into law. The first step was the Mining Industry Act of 1926, providing, among other things, for voluntary amalgamation of producing facilities. It was accompanied by a law permitting the working of an 8-hour day, passed over bitter opposition from the miners.

Following the strike of 1926, reflected in passage of a law prohibiting general strikes in 1927, British coal companies, in line with the act of 1926, began consideration of amalgamations and several were consummated where conditions favored them. The operators also did considerable spade work on the establishment of district sales agencies. These, of course, were directed at primarily the same objectives as the sales agencies and later the N.R.A. and the Guffey acts in this country.

Chance Denied Britain

Whether the industry would have pulled itself out of its situation by its own efforts naturally is a matter for speculation. The fact is that it did not have a real chance to function under the principles of free enterprise. Late in 1929, the Labor government, in accordance with its campaign promises, brought out a new coal mines bill. Passed the following year as the Coal Mines Act of 1930, the act provided for organized marketing of coal in accordance with district schemes coordinated into a national scheme and providing for restriction and allocation of production and price regulation.

If the act had stopped with that, perhaps the coal picture in Great Brit-

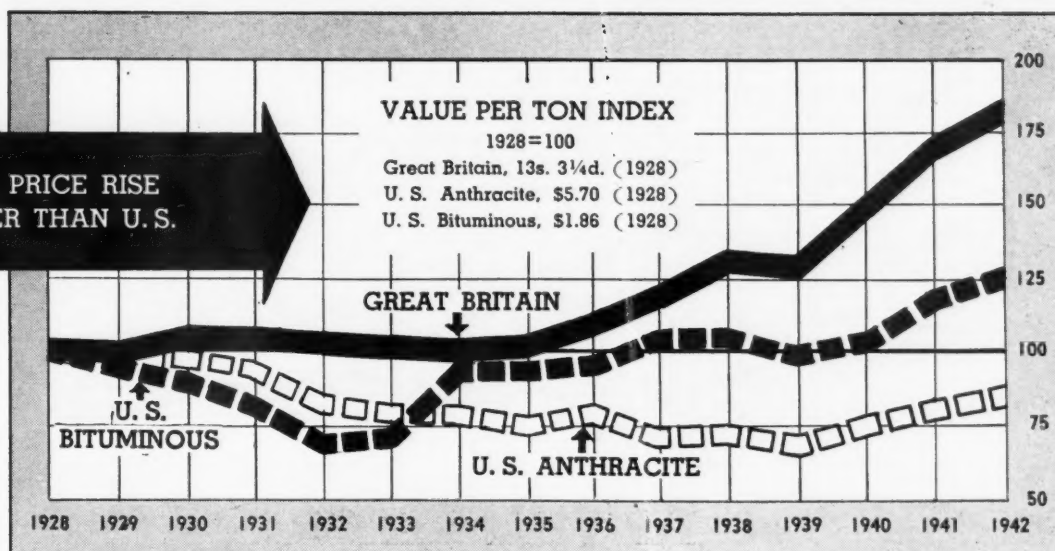
ain would have been different, since the selling organizations and principles evolved under this section were given major credit in helping the industry meet its wartime demands as well as it did. The act went further, however, and attempted to jam compulsory amalgamation of properties down the industry's throat, until even an indulgent government finally found it expedient to call off the Coal Mines Reorganization Commission in 1935 after one forced amalgamation scheme had been thrown out by the courts.

The act of 1930 also set up a Coal Mines National Industrial Board to adjust wages and hours disputes and reduced working hours from 8 to 7½ per day with provision for a "spread-over" arrangement when approved by the miners and owners. The miners promptly rejected the arrangement.

The 1930 developments brought a glum remark from the *Colliery Guardian* that "Political events once again overspread the industry like a pall." That same description was equally applicable to succeeding years. In successive renewals of the act of 1930, labor continued to gain more and more points while management was more and more deprived of its normal functions. Despite the necessity for calling a halt in the activities of the Reorganization Commission, an attempt was made to revive it in the act of 1936, but a section renewing its powers was thrown out because machinery for appealing its decisions was omitted from the bill.

But the government persisted, and the act of 1938 reestablished the Reorganization Commission. Furthermore, it legalized an even bolder step—acquisition of the ownership of the coal of Great Britain at a price later

BRITISH PRICE RISE
GREATER THAN U.S.



fixed at £66,500,000. The operators were more favorable than not to government ownership of the coal, but in view of past experiences were bitterly opposed to the amalgamation provision.

The result of this continued yielding to the miners and "liberal" elements, accompanied by increased encroachments on the normal preserves of management, stripping it of more and more jurisdiction and authority, made itself felt in dangerous fashion when Hitler began to march. Uncertain, as always, of what the government would do next, inclined in consequence to contract rather than expand operations, and with less and less control over their properties and their labor policies, the operators were in a bad way to cope with the emergency when it arose. Also, as might be expected, government likewise was in no position to supply the missing initiative. In fact, government chalked up its greatest failure in the field in which it might have been expected to function best—assuring the requisite manpower to get out the coal that plainly would be needed.

What happened when the war hit Great Britain? In 1939, when she entered the hostilities, production rose to an estimated 231,000,000 long tons, still substantially less than the 240,409,436 tons in 1937. Output hit the skids in 1940, however, and since has steadily declined to some 203,600,000 tons in 1942, in contrast with year-by-year increases in the United States. In 1943, according to available data, British output will exceed 1942 by very little if at all. In fact, production in August, 1943, after 13 months of government control, was announced as the worst in two years.

Much of the decline in output is traceable directly to the manpower situation. For some time after the war started, the armed services and other industries had practically a free hand with mine employees. Eventually, the government returned several thousand men from the army and adopted the Essential Work Order. The effect, however, was rather like slamming the barn door after the horse had been stolen. Now, recruiting of boys is one of the measures being considered in an attempt to alleviate the shortage.

At the end of the first quarter of 1939, mine employment was reported at 758,110. At the end of the second quarter in 1940, it was 760,437; 1941, 695,433; 1942, 706,722; 1943, 711,726. For the year 1937, in contrast, the total was 776,139.

British Gap 11,000,000 Tons

This drop in employees, only partially repaired by severe measures in 1942 and 1943, with its accompaniment of increased absenteeism and decreased output per man (5.81 long tons per week in 1939 to 5.50 in 1942), confronted Great Britain with a critical problem in reversing, if possible, the declining production rate. A corollary problem was economy in use of coal, in which substantial progress has been made, in contrast with the production picture. In October, 1942, the gap between production and consumption was stated to be 11,000,000 tons. That gap has yet to be closed.

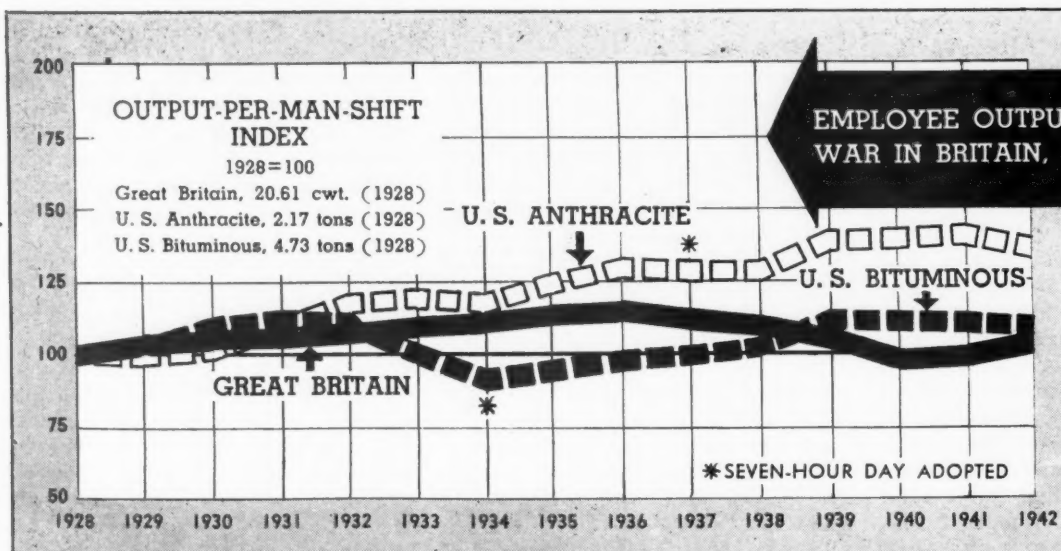
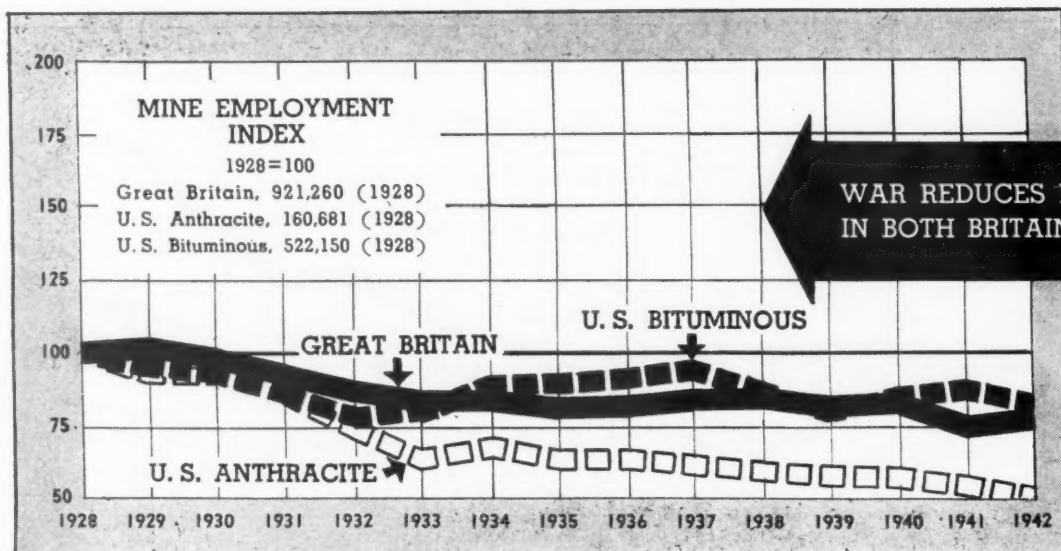
One early step to increase production per man was the institution of a bonus system by the government. "Targets" were set for each of the 24 producing districts of the United Kingdom. Workers in any district

exceeding the target by a full percentage point for a period of four weeks were entitled to a bonus of 3 pence per point per shift. In other words, if production was 106 percent of target, workers received, for a 5½-day week, a bonus of 8 shillings 3 pence.

The bonus system proved a flop, one reason being that the workers were inclined to view it not as an incentive to increased production but as regular wages. The bonus became effective Sept. 6, 1942, and at the end of the year was earned by men in twelve districts. The picture changed in 1943, however, and in no four-week period were bonuses paid in more than four of the 24 producing districts. The scheme had obviously failed of its primary purpose—increasing production.

The continuing decline in production finally moved the government to take still another and more drastic step—control over coal mining approximating complete nationalization. The plan was announced in the White Paper of June 3, 1942, and the program, after Parliamentary approval, went into effect June 13. This Coal Mining Undertakings Control Order set up a Ministry of Fuel and Power to take over all the functions of the Board of Trade in regard to mines, gas, electricity and petroleum, and to assume full control over the operation of the coal mines, on the basis of national service, for the duration of the war.

The first aim—increased production—was the objective of new machinery comprising a controller-general assisted by directors for production, labor, services and finance; a national coal board to plan production on a national scale; and regional controllers for each district empowered to assume



control over mining operations and issue "directions" to management. Coal boards also were set up in each district along with joint labor-management committees at each mine. In addition, provisions were made for channeling men into the industry, for recruiting boys, and for a medical consultative service. The government also assumed supervisory power over wages, although permitting, to a large extent, the two parties to work out their own problems. A rationing system for domestic consumers also was proposed but was not put into effect.

In effect, while private management remained on the scene, the new order deprived it of almost all its power. That passed to the regional controller and, in some instances, unofficially but definitely, to the labor members of the pit committees. The government also assumed the power to take actual physical possession of mines, although to date it has exercised it sparingly.

What were the results? To date, they have been lower production, lower efficiency and higher coal prices. True, the British Government now is working on plans designed to reverse these trends, but to date the results are not such as to engender a feeling of unbridled optimism. To come down to cases, complete government control so far has failed to get out the coal needed to fight the war.

U. S. Meets Demands

Coal mining in the United States also faced loss of manpower, the necessary use of older employees and unskilled recruits, increasing absenteeism and unprecedented demands for coal. Yet, in the face of stoppages which cost some 25,000,000 tons, coal mining in this country is meeting war requirements to the tune of the greatest production in history. Output per man has been maintained relatively much better than in Great Britain,

and before 1943 was increasing—a major factor in enabling the industry to meet production goals with relatively much larger manpower losses. And with all that, the cost of coal in Great Britain has increased, percentage-wise, far beyond the U. S. rises.

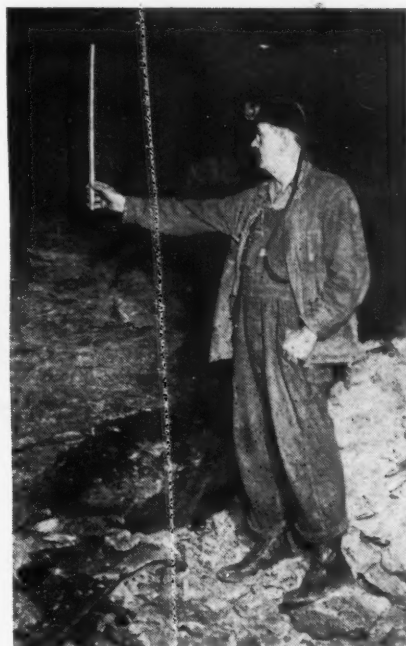
The fundamental factor, it is plain, is that in Great Britain the coal-mining industry, sapped by governmental heckling and uncertainty, was deprived of the necessary elasticity to meet the burden thrown upon it by the war. In the United States, with management free to build for the future and to take advantage of modern methods of cutting cost and improving quality and service, the necessary reserves in both capacity and initiative were there when the nation was precipitated into the greatest crisis in its history—World War II.

Would anyone dare to change a system that has proved itself so well in time of trial?

COAL AS THIN AS 20 IN.

Provides Large Output With Conveyors

With a Seam Thickness of 0 to 38 In., Bradford Mine Regularly Works Down to 20 In. to Get 1,150 Tons per Day—Duckbills Load Coal and Rock in Entries —Shakers Used in Aircourses and Rooms



While the duckbill is stopped E. L. Dorri-cott, engineer, measures the coal at the face of the heading. It is 19 in.

Duckbill loading of fireclay bottom in driving a heading to be tracked for mine cars. All of the five photographic illustrations for this article were made near the head of an entry being driven by duckbill and shakers.



By J. H. EDWARDS
Associate Editor, *Coal Age*

RECENT NUMEROUS installations of machinery underground in the coal mines of Alabama end the years of contradictions which have characterized developments in that State. Difficult and varying mining conditions were responsible for mechanical mining being pioneered in Alabama, then for a long lag in general progress and eventually a spurt that has brought those coal fields to the fore in modernization. In numbers, shaker conveyors outrank the other types of

equipment and it was that type which was installed back in 1922 on five 325-ft. walls to make Aldrich mine of the Montevallo Mining Co., Aldrich, Ala., one of the first 100-percent mechanical operations in the country. Difficult conditions forced shakers into Aldrich and now, two decades later, Bradford mine of the Alabama By-Products Corp., with still more difficult conditions, has been given a new lease of life by virtue of the installation of modern shakers and duckbills.

Working height in Aldrich mine was 50 in. including 6 in. of rashy slate 4 in. from the bottom and 8 in. of rash at the top. Above was 15 in.

to 15 ft. of drawslate. For the successful operation of this mine D. A. Thomas, president of the Montevallo company, imported electric-driven shakers from Scotland (*Coal Age*, December, 1925, p. 915).

In contrast, the Bradford mine, at Dixiana, Jefferson County, Ala., now is recovering the Black Creek seam, ranging from 0 to 38 in. in thickness. In entry development at Bradford in the last six months the average thickness of coal was 19.8 in. and in the 49 active rooms worked mechanically the average was 22.7 in. The daily production bogey for the mine is 1,250 tons of washed coal and actual output

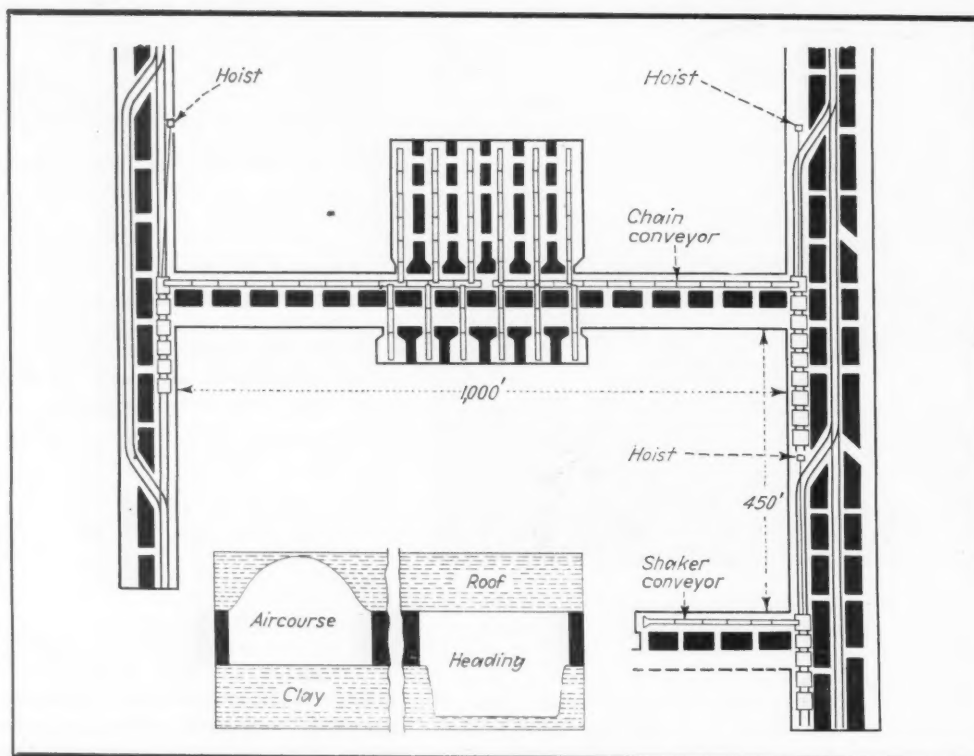


Fig. 1—New plan of conveyor work showing heading and aircourse rooms working.

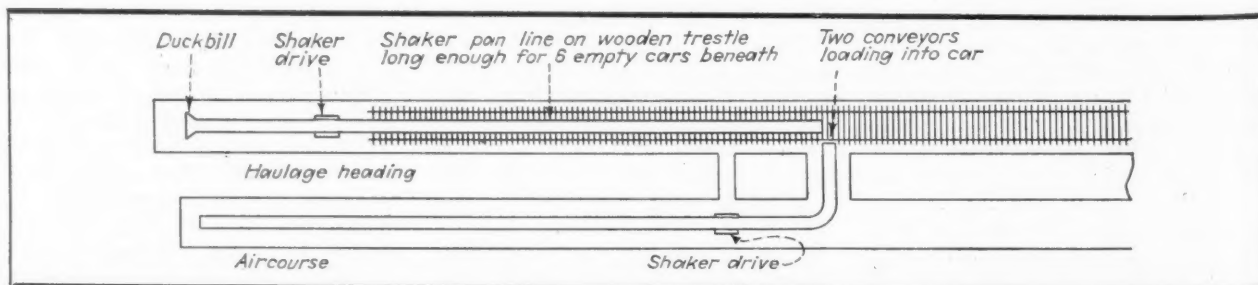


Fig. 2—Method of driving haulage entries using duckbills in heading, shaker in aircourse and a trestle providing space for six empty cars under the pan line of the duckbill shaker.

FAR LEFT

...ing the shaker conveyor in driving the air-
course.

LEFT

...this point, which was developed through by
...bill on "50th Right Main Heading Off the
...e," T. L. Hall, mine foreman, points out that
...coal thickness is 13 in.

RIGHT

...empties are stored back under the elevated
...charge end of the conveyor. The other
...ter (left) is developing the aircourse by a
...deg. turn at the breakthrough.



is being held at 1,150 tons in spite of the labor shortage.

In room workings, a coal face is abandoned only when the coal thins to less than 20 in., though many cuts are taken in places much thinner than 20 in. in the hope of hitting thicker coal. Often entries are driven through 20- to 50-ft. stretches of coal 10 to 15 in. thick. The bottom is fireclay 4 to 5 ft. thick and the top a sandy shale of medium strength. In the present working area the seam lies nearly level and has 180 ft. of cover. Haulage of 13,000 ft. along the main slope to the portal is handled by five 13-ton locomotives delivering to the bottom of an 1,800-ft. rope haul of which 900 ft. is on the outside. Twelve gathering locomotives—three 8-ton, two 7-ton, four 6-ton and three 4-ton—are in use on cross entries and dip headings.

Fewer Entries Now Needed

In this mine the cross entries or parallels (also termed room entries in conveyor work where devoid of track) are turned at 80 deg. off both sides of the main slope, and some of those cross entries, on the right side of the mine, will extend 12,000 ft., which is the distance to the boundary. For mechanical mining the cross entries are now developed on 500-ft. centers and the rooms driven from both sides. In most of the old workings and in some of the active hand-loading workings on the left side of the mine these cross entries are on 200-ft. centers and the rooms are there driven only one way—upgrade—and the men push the cars.

Dip headings are parallel to the main slope on 1,000-ft. centers in a new plan of conveyor mining instead of 2,000 ft., as in the layout for the first conveyors installed. On the main slope, roof clearance is made 62 in. above the top of the rail and this height for the most part is obtained by lifting bottom, thus facilitating drainage. Headroom of 50 in. is provided on cross entries and dip headings and this material is taken mostly from the bottom. When grades are adverse, however, it is taken partly or all from the top. In a section on the left side where the work is still by hand loading into mine cars it is necessary to have 36 in. of height in the rooms and this is obtained by lifting the fireclay bottom. Coal sections at the faces of rooms in this section average 23.4 in. in thickness.

Three Goodman duckbills (Type D automatic, size 1) are used for loading both coal and slate in driving haulage headings. Practically all of the rock and slate from development work is brought out of the mine. It adds up to one carload of rock for every three carloads of coal dumped at the tippie. In room work two mechanical set-ups are in use, each consisting of three room conveyors, a chain mother conveyor and a chain cross conveyor. Both chain and shaker conveyors are in use in the rooms, but the latest purchases have been shakers.

The conversion to mechanical mining already attained in the Bradford mine has enabled the management to ship 2.5 tons of washed coal per man-shift including surface employees. On

the first shift of the day the mine is operated about 50-50 on hand and mechanical work. On the second shift the work is entirely mechanical and, although the tippie and washer are operated on that shift, the preparation crew consists only of a skeleton force of four men. On the hoot-owl shift no hoisting is done and only a skeleton crew is employed underground.

Too Thin for Duckbills

Duckbills have not been added to the room conveyors because the seam does not afford the 30 in. which experience in the mine indicates is required for their operation. Rooms are 30 ft. wide, shaker pan lines are on the center line and no face conveyors or bellerank sections are used. A room crew consists of three to four men at the face. Cutting, with tipped bits, is done in the fireclay bottom where the seam is thin; otherwise in the coal. Drilling for coal shooting is done with electric drills.

Drawslate averaging 3 in. and ranging from nothing to 10 in. comes down in rooms and practically all is gobbled therein, along both sides. Posting in rooms consists of southern pine props set 2 to 5 ft. apart, depending on the strength of the roof in that particular section.

Fig. 1 shows the method of developing 1,000-ft. room entries. No track is installed in the aircourse used with the cross-haulage entry. Cross-sectional area of the aircourse is standardized at 32 sq.ft. for ventilation; therefore the width ranges from 10 ft.

to 18 ft., depending on the seam thickness and thickness of top taken. In the earlier system, sufficient height was made in the aircourse for track and car service. In that system it was necessary that the chain mother conveyor be moved from the haulway to the aircourse for mining the rooms on the aircourse side. So, this new system saves many conveyor moves.

The duckbill and shaker method being used to develop cross entries and dip headings to be tracked for car haulage is shown in Fig. 2. From the duckbill and beyond the drive the conveyor is elevated to the top of a trestle sufficiently long to allow pushing six empty mine cars underneath. The driving unit for the aircourse shaker is moved to and from its location through the breakthrough, in which enough top or bottom is taken to provide the necessary height.

Hoists are used exclusively for car spotting at conveyor loading points. Car equipment consists of 300 1½-ton steel cars bought six years ago and 200 older 1-ton wooden cars. All are solid-body units and stand 32 in. above the rail. Weights of rails are 90-lb. on the rope-haulage section of the main slope, 60-lb. on the locomotive haul of the slope and 30-lb. on the cross entries and dip headings. Long-type bonds, arc-welded, are used on all tracks.

Electrical System

Direct current at 275 volts powers all of the underground transportation and mining machinery. Of the four substations furnishing this current, all underground and consisting of motor-generator sets, two are full-automatic and the other two have automatic reclosing breakers on the d.c. side. One unit is rated 300 kw. and the others 150. Cables feeding 2,300 volts (purchased power) to these substations enter the mine through boreholes. Power required for mining, transportation, tipple, cleaning plant and refuse disposal averages 14.5 kw.-hr. per ton of washed coal shipped.

The mine is classed as gassy and the ventilation consists of 97,000 c.f.m. circulated by a modern propeller-type exhausting fan at the top of a slope 2 miles from the haulage portal (see Fig. 3). The workings at the left in Fig. 3 clearly indicate, by their greater regularity, the change to mechanical mining, which allows working thinner coals. This has increased the percentage of recovery. The mine was opened in 1917 but has territory for 25 more years of operation at the present rate of output.

Cars are hoisted on a single track, 14 at a trip, and dumped two at a

time without uncoupling in an electric-driven rotary dump which makes a half turn and reverses. Cars of mine refuse, hauled in the same trips with the coal, are emptied by the same dump and this material is diverted by a flygate. By an auxiliary hoist operating a Barney which drops below track level at the lower end an empty trip is controlled and started on its way down the slope while the loaded trip is being dumped. On main hoisting duty the 1½-in. rope (purchased in a 2,400-ft. length) lasts around 9 months and hoists over 300,000 tons of rock and coal.

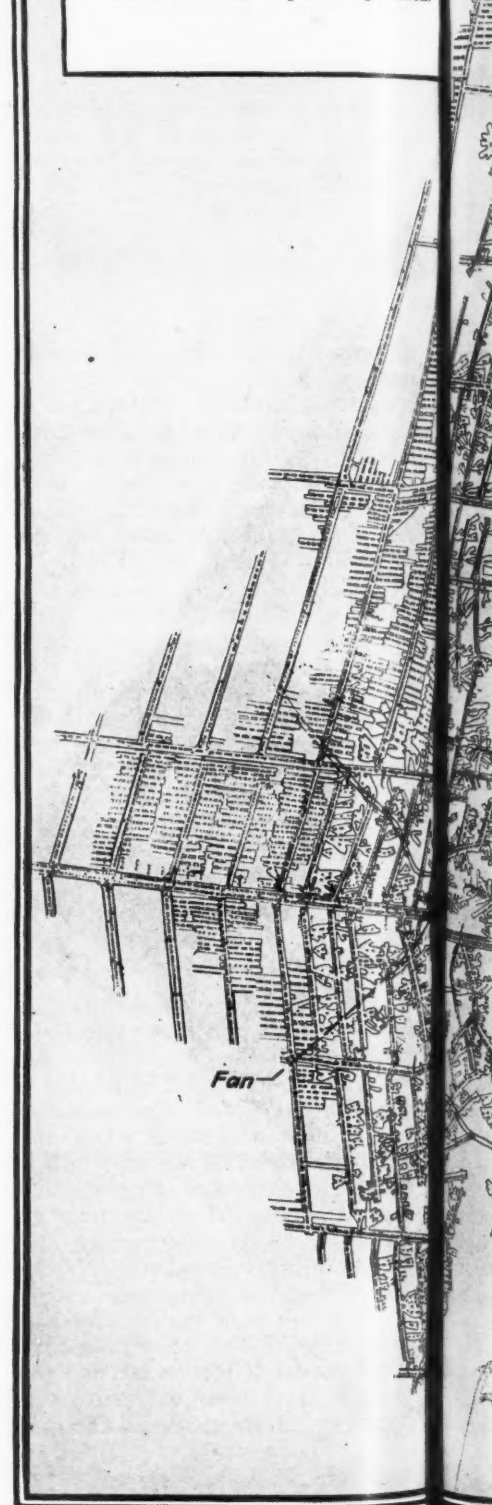
Gas, Oven, Smithing Coal

Ninety percent of the coal produced by Bradford mine, which is one of six coal operations of the Alabama By-Products Corp., goes to the corporation's byproduct coke plant at Tarrant City, where gas is made for the City of Birmingham. Other products of the mines, besides this bulk of 3x0-in. oven coal, are 3x1-in. nut and ½x½-in. blacksmith coal. The latter is shipped great distances—some to the Pacific states—and some of it is bagged. All of the run-of-mine raw coal is crushed to 3-in. and washed in plunger jigs, of which six are in use. Inherent ash is low and washing keeps the ash content of the output to 3 percent or less.

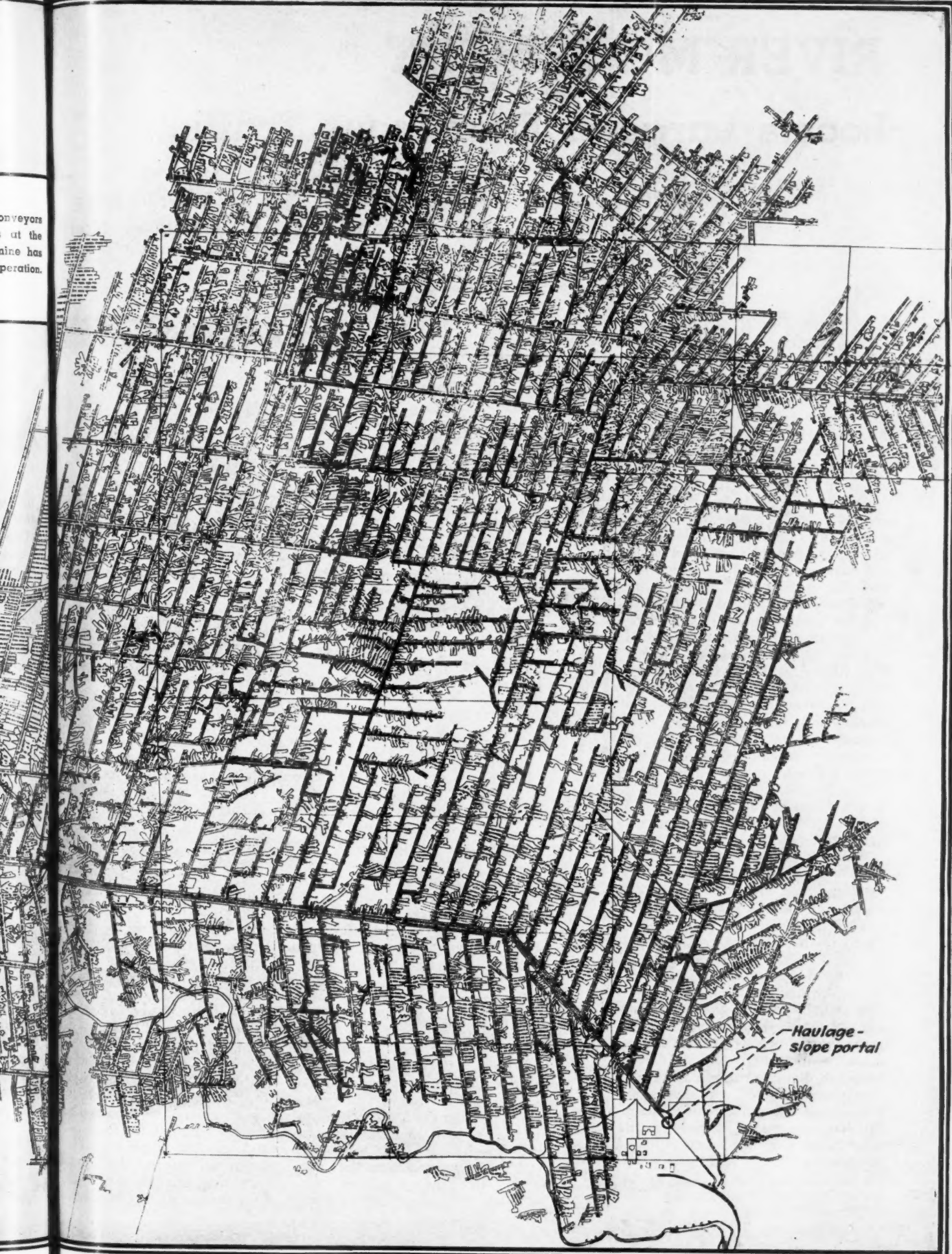
Locomotive-tire maintenance at this mine has been resolved to arc filling for both main-line and gathering units and seldom is a new tire purchased. Even on locomotives with the wheels inside of the frame, the trucks are not removed for the build-up job. Gage strips ¾x½ in. or ½x½ in., depending on degree of wear, are "tacked" around the center of the worn groove and the remainder of the space is filled to the top of the strip by electrode. Welding is stopped every few inches and the hot metal hammered vigorously to condense it and smooth the surface. Some years ago welding wide bands into the grooves was tried, but, as is all too frequent where it has been done without preparing a flat seat, the bands came loose before they wore out (for a survey of tire practice over the country see *Coal Age*, October, 1942, p. 99).

Mine operating officials of the Alabama By-Products Corp. are P. H. Haskell, Jr., general manager; W. C. Chase, general superintendent; M. E. Haworth, chief engineer; and Frank Hillman, safety director. At the Bradford operation B. E. Patterson is superintendent; T. L. Hall, mine foreman; M. D. Simback, chief electrician; and E. L. Dorricott, engineer.

Fig. 3—New work with conveyors at Bradford mine appears at the left. Opened in 1917, the mine has coal for 25 more years' operation.



conveyors
at the
mine has
operation.



RIVER MOVEMENT

Looms Large in Bituminous Traffic*

More Than 24 Percent of the Bituminous Tonnage Is Water-Borne, With Rivers Handling a Large Share—Ohio and Tributaries Most Important, Mississippi and Black Warrior Next in Traffic Rank

By M. LELYN BRANIN

Chief, Research Division
Office of Bituminous Coal Consumers' Counsel

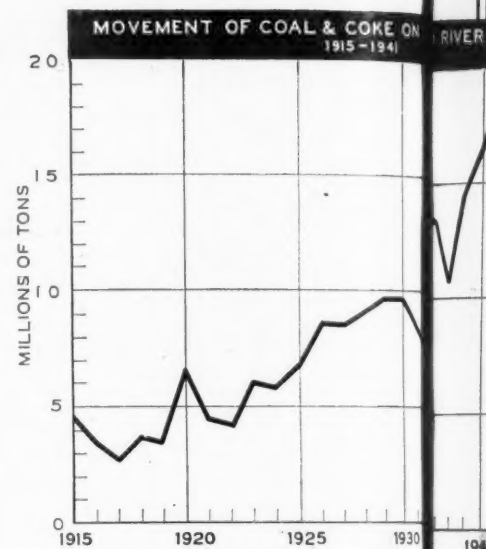
MORE THAN 24 percent of the total tonnage of bituminous coal consumed in the United States moved either on the Great Lakes or on the coastal and inland waterways of the country in 1942. From this it is evident that water-borne commerce is making an important contribution to our war effort on the home front and that it continues to be an integral part of our transport system.

River transportation of bituminous coal in America apparently dates to Colonial days, when coal was shipped from Richmond, Va., down the James River and thence to various towns and cities along the Atlantic coast, including Boston and Philadelphia. Presumably an act passed in 1765 by the General Assembly of Virginia, for opening a canal, resulted largely from the coal trade. Further evidence of this is shown by the passage in 1772 of an act providing for a tax on coal passing over the canal.¹

With the settling of towns along the Ohio and Mississippi River systems and the discovery of coal in western Pennsylvania and what are now the states of West Virginia, Ohio, Kentucky and Illinois, local shipments of coal on these river systems developed. By 1865 the Kanawha field in West Virginia was mining and shipping coal by river to the Cincinnati area, from which point ex-river shipments by railroad were made to Indiana, southwestern Ohio, Illinois, Michigan, Kansas, Missouri and Iowa. This preceded by 16 years the establishment of rail connections between the Kanawha coal field and Cincinnati.² In the Cincinnati market, Kana-

wha coal had to compete with coal transported down the Ohio River from the Pittsburgh area. This river movement to Cincinnati and ex-river shipment to points beyond still represents a substantial tonnage of bituminous coal. During the period from 1924 to 1934, approximately a million tons of coal yearly originated on the Kanawha River. Since 1934, river shipments from this area have steadily increased, the 1941 total being about four and a half times the 1924-34 average. Generally speaking, about half the total tonnage is distributed to points on the Kanawha River and the other half finds its way into the Ohio River for shipment to river points including the Cincinnati area.

The Ohio River in its original condition was obstructed throughout its entire length by rocks, snags, gravel and sandbars, and at extreme low water the depth at places reached a minimum of 1 or 2 ft. In 1824, Congress made an initial appropriation for improvement of the river, and the first dike was constructed near Henderson in 1865. Certain stone wing dams were built between 1837 and 1844, and open-channel improvement was begun in 1866. In 1875 a comprehensive survey of the river was completed in anticipation of providing slack-water navigation for the entire length of the river. It was proposed that 68 dams with a lift of 6 ft. be erected. The first of these, Dam No. 1, at Davis Island, about five miles below Pittsburgh, was opened to commerce on Oct. 7, 1885, and "Pittsburgh enjoyed for the first time in her history an ample low-water harbor for steamboats and waiting coal fleets."³ Ever since 1885 coal has been regularly transported on the Ohio River, and in recent years there has been a rather rapid and persistent increase in total tonnage. In 1917 a little less than 3 million tons of coal and coke was carried on the river. By 1929 the tonnage had increased to nearly 10 million, and by

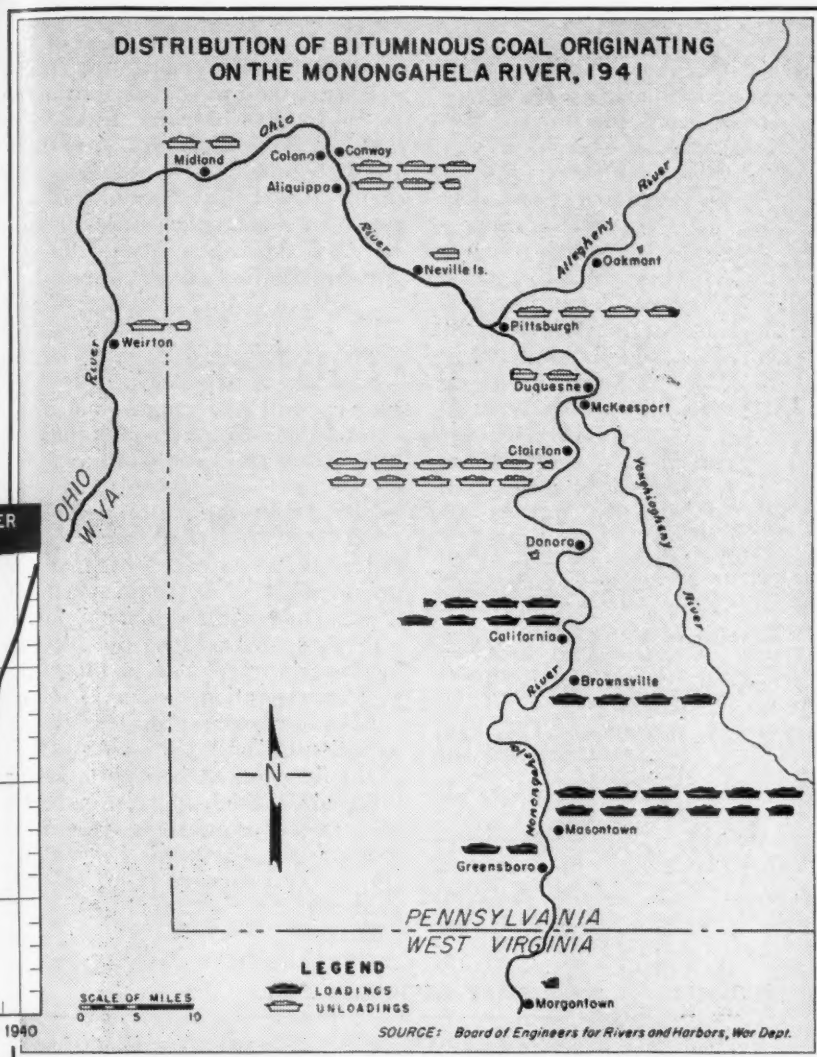


1941 it amounted to over 19 million tons annually.⁴

As far as coal movement is concerned, the Ohio River area may be arbitrarily divided into three principal regions. The heaviest movement is down-river between Pittsburgh and New Martinsville, W. Va. While some coal originates here, the region is primarily a terminal area. This coal is distributed to industries and utilities situated on or near the river, although there is some ex-river shipment by rail. In recent years the largest single terminal region has been the Aliquippa-Colonna-Conway area. Next in importance, as far as total tonnage movement is concerned, is the region from New Martinsville to Kosmosdale, Ky., about 25 miles below Louisville. A large volume of the coal distributed to this area comes from the Kanawha and Huntington regions. Included here is the Cincinnati area, which, as previously mentioned, receives a substantial volume of coal for local delivery and ex-river shipment. The third movement, for the most part, involves coal originating on the Trade-water River in the vicinity of Casey-

* Published with the permission of Luther M. Harr, Bituminous Coal Consumers' Counsel.

DISTRIBUTION OF BITUMINOUS COAL ORIGINATING ON THE MONONGAHELA RIVER, 1941



to form the Ohio River at Pittsburgh. The Monongahela, serving portions of the rich Klondike, Connellsville and Pittsburgh fields of western Pennsylvania and the Fairmont field of northern West Virginia, is the largest originator of coal tonnage. Total loadings in 1941 exceeded 25 million tons, more than half of which was distributed to points along the river itself, including Pittsburgh. Originating and terminal tonnages for the Monongahela River are shown on the accompanying map. Many mines load coal directly into barges along the banks of the river, whence shipment is made to industrial plants in the Pittsburgh area. Each year a proportionately small part of this tonnage moves up the Youghiogheny River to terminal facilities at McKeesport, Pa.

Closely related to the Monongahela movement, although much smaller in volume, is that on the Allegheny River, which arises in northern Pennsylvania and flows northwest into New York State and then southwest to Pittsburgh, where it unites with the Monongahela to form the Ohio River. It has a navigable length only about half that of the Monongahela. The Allegheny River connects the Kittanning and Freeport fields of western Pennsylvania with Pittsburgh and the Ohio River and is primarily an originating river. Coal moving on the river in recent years has totaled about one million tons annually.

Perhaps even more than the Ohio River, by reason of its larger size, the Mississippi River has played a colorful role in the history and development of our country. Arising above Lake Itasca in Minnesota, it flows through the entire mid-continental area of the United States from the northern forest areas to the cotton and tobacco fields of the deep South. When it empties into the Gulf of Mexico it has traversed nearly 2,500 miles. Together with its tributaries it includes about 15,000 miles of navigable channels and covers an area of approximately 1,239,000 square miles.*

As far as coal is concerned, the Mississippi River is primarily an originating river, although in magnitude the total tonnage does not compare very favorably with that originating on some smaller rivers such as the Monongahela and the Kanawha. Somewhat under a million tons yearly is loaded onto barges on the Mississippi River. This coal originates mostly in southern Illinois and is shipped by rail to loading docks near Alton and East St. Louis, Ill., where it is transshipped by barge. The tonnage originating on the Mississippi is augmented by coal reaching the Mississippi River from

ville, Ky. It is distributed along the lower Ohio River region from Evansville, Ind., to Paducah, Ky., and down the Mississippi River as far as Memphis, Tenn., and Greenville, Miss. In total tonnage, it is relatively small.

An important tributary of the Ohio River, the Tennessee River, is formed by the confluence of the French Broad and Holston rivers in eastern Tennessee about 4 miles above Knoxville. Flowing across northern Alabama, Tennessee and Kentucky, it enters the Ohio River at Paducah, Ky., traversing a total distance of about 650 miles. A series of multi-purpose dams, such as the Kentucky, Pickwick, Wilson, Wheeler, Guntersville, Hales Bar, Chickamauga, Watts Bar, and Fort Loudon, have been erected on the river and are administered by the Tennessee Valley Authority. Some, including Wilson, Hales Bar and Watts Bar, have steam plants adjoining them.⁵ Coal movements on the river, of recent origin, may be considered a direct consequence of this power system development. At present practically the entire tonnage of coal is consumed by the power dams

and war industries in that locality.

Another tributary forming part of the Ohio River system is the Muskingum River, which originates at Coshocton, Ohio, and flows into the Ohio River at Marietta, Ohio. It lies wholly within the State of Ohio. Coal shipments on the river originate in the Crooksville field near Zanesville, and most of the tonnage is transported to a single consumer located farther down the river. The movement is entirely local and intra-river.

Other rivers of the Ohio River system which play a minor role in coal movement are the Big Sandy, Kentucky and Licking. The latter two have terminal facilities a short distance from the mouth and are primarily receiving rivers for coal. The Big Sandy, on the other hand, is an originating river. In each case the tonnages involved are relatively small.

The largest single channel for river movement of coal is the Monongahela River, formed by the junction of the Tygart and West Fork rivers about one mile south of Fairmont, W. Va. It flows northerly about 128 miles until it joins with the Allegheny River

the Illinois fields via the Illinois Waterway and from the Kanawha district via the Ohio River. It is distributed principally in Minnesota, Wisconsin and Iowa. A smaller tonnage of coal—about 11,500 tons in 1941—reaches the St. Croix River each year from the Mississippi River and is distributed in Minnesota. As previously mentioned, a small tonnage moving from the Caseyville (Ky.) area via the Ohio River also enters the Mississippi for distribution along the lower Mississippi River.

In recent years under 10,000 tons of coal yearly has moved on the Missouri River both above and below Kansas City—mostly local traffic.

The Illinois Waterway comprises the Illinois River from its mouth to the confluence of the Kankakee and Des Plaines rivers, the Des Plaines River to Lockport, and the Chicago Sanitary and Ship Canal, including the south branch of the Chicago River to Lake St., Chicago. It also includes the Calumet-Sag Channel and the Little Calumet and Calumet rivers to a point near the entrance to Lake Calumet. The total distance from Grafton, Ill., to Chicago is about 330 miles. In recent years approximately $\frac{1}{2}$ to $2\frac{1}{2}$ million tons of bituminous coal has originated along the waterway, most of

it transported to industries in the Chicago area, although a sizable tonnage moves across the Illinois-Mississippi Canal to the Mississippi River for distribution in Iowa.

The only remaining river movement of coal of any consequence is that on the Black Warrior system in Alabama. The Black Warrior, including the Warrior and Tombigbee rivers, has its source in northern Alabama and flows southwesterly until it joins with the Alabama River to form the Mobile River about 45 miles above Mobile Bay. It covers about 450 miles. Coal movements are entirely intra-river. The coal originates at mines adjoining the Mulberry Fork of the

river in the Birmingham region of northern Alabama and is distributed as far south as Mobile. River-borne coal in 1941 totaled 335,056 tons.

While in the past railroads and motor freight have made great inroads on water-borne freight movements in the United States, it is unquestionable that water transportation has certain distinct advantages over other kinds. It is slower than rail or motor freight, but it is equally adaptable if not actually superior to both for large bulk movements—and is undeniably cheaper. In anticipation of these advantages, communities located on or near large inland waterways probably will continue to avail themselves of this means of transportation. Indeed, with constant extension and improvement of navigation facilities, it seems not unlikely that the inland waterways are destined to play an increasingly useful role in the future as a transportation medium.

Acknowledgment is made of the cooperation of Raymond E. Kerr, Chief of the Economics Division, in making this study. Much help in the gathering of data was afforded by Homer F. Johnson and Thomas J. Leonard Jr., also of the Economics Division. The illustrations were prepared by Roy W. Collins.

¹ Armitage, Laura E.: "Coal From Colonial Diggings; The Fusion Point," April-May, 1943.

² Report and Recommendations of Committee of Bituminous Coal Producers' Board for District No. 8 (typewritten copy), 1939; Office of the Bituminous Coal Consumers' Counsel.

³ "The Ohio River," Office of the Chief of Engineers, War Department, 5th Edition, 1934.

⁴ Board of Engineers for Rivers and Harbors, War Department.

⁵ Annual report of the Tennessee Valley Authority for 1941.

⁶ "Transportation Lines on the Mississippi River System," Transportation Series No. 4, 1936; Corps of Engineers, War Department.

PRINCIPAL TONNAGE MOVEMENTS OF RIVER-BORNE BITUMINOUS COAL*

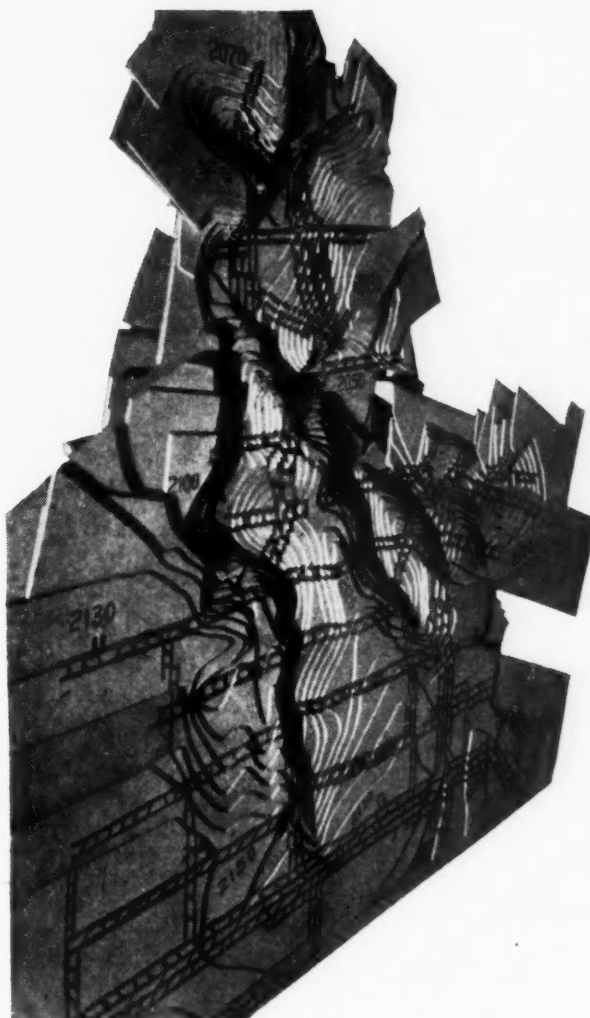
Year	Originating on River	Used on River	Inbound	Outbound	Total Movement	Year	Originating on River	Used on River	Inbound	Outbound	Total Movement
ALLEGHENY RIVER						MONONGAHELA RIVER					
1937	892,300	12,400	323,400	879,900	1,215,700	1937	21,423,700	13,571,100	67,900	7,852,600	21,491,600
1938	964,100	1,000	227,700	963,100	1,191,800	1938	12,633,100	6,830,200	11,400	5,802,900	12,644,500
1939	1,009,400	9,200	251,700	1,000,200	1,261,100	1939	18,078,000	10,598,100	166,300	7,479,900	18,246,000
1940	1,038,800	14,000	387,700	1,024,800	1,426,500	1940	25,124,800	15,666,900	212,400	9,457,900	25,337,200
1941	1,056,900	8,800	256,400	1,048,100	1,313,300	1941	25,324,300	14,762,000	341,000	10,562,300	25,677,600
BLACK WARRIOR RIVER						MUSKINGUM RIVER					
1937	104,394	104,394	.....	.....	104,394	1937	726,754	726,754	.....	.....	726,754
1938	172,254	172,254	.....	.....	172,254	1938	714,916	714,916	.....	.....	714,916
1939	131,250	131,250	.....	.....	131,250	1939	699,558	699,558	.....	.....	699,558
1940	141,759	141,759	.....	.....	141,759	1940	724,965	724,965	.....	.....	724,965
1941	335,056	335,056	.....	.....	335,056	1941	975,534	975,534	.....	.....	975,534
ILLINOIS WATERWAY						OHIO RIVER					
1937	1,720,800	1,720,700	3,200	100	1,728,600	1937	2,719,448	12,592,294	10,015,688	142,842	12,755,981
1938	1,927,400	1,924,800	24,300	2,600	1,976,200	1938	1,751,623	10,126,705	8,462,167	87,085	10,262,857
1939	458,900	458,700	18,700	200	490,900	1939	3,138,366	13,277,787	10,395,739	256,318	13,573,941
1940	952,200	949,800	4,800	2,400	958,400	1940	3,437,485	15,489,619	12,361,616	309,482	15,840,661
1941	2,479,800	2,363,100	34,200	116,700	2,562,400	1941	4,169,576	17,934,615	14,188,832	423,793	18,400,872
KANAWHA RIVER						TENNESSEE RIVER					
1937	2,786,100	1,087,500	.....	1,698,600	2,786,100	1937	1,940	3,091	1,151	.....	3,091
1938	2,897,600	879,200	.....	2,018,400	2,897,600	1938	5,920	8,020	2,100	.....	8,020
1939	3,349,900	1,102,400	.....	2,247,500	3,349,900	1939	6,425	8,455	2,030	.....	8,455
1940	3,714,800	1,359,400	.....	2,355,400	3,714,800	1940	4,636	5,771	1,135	.....	5,771
1941	4,454,900	1,582,000	.....	2,872,900	4,454,900	1941	1,243	3,019	1,776	.....	3,019
MISSISSIPPI RIVER						YOUGHIOGHENY RIVER					
1937	222,867	212,542	69,438	10,325	312,526	1937	11,883	.....	81,228	11,883	93,111
1938	305,913	300,227	104,303	5,686	412,506	1938	2,257	.....	47,693	2,257	49,950
1939	391,434	379,072	96,644	12,362	499,746	1939	1,772	.....	51,276	1,772	53,048
1940	551,885	535,288	62,629	16,597	650,162	1940	.....	.....	52,031	.....	52,031
1941	639,530	578,695	175,369	60,835	847,363	1941	23,690	.....	13,299	23,690	36,989

* Source: Annual Reports Chief of Engineers, War Department.

COAL-SEAM "VALLEYS"

Revealed by Relief Model of Workings

Showing plainly the valley system, this relief model of the coal seam elevations also indicates that the vein was deposited on a water-eroded base.



ALTHOUGH LYING generally on a plane not far from level, the Beckley seam in Raleigh County, West Virginia, is noted for the local pitches and dips encountered in mining it. Entries often encounter dips with grades of 10 to 35 percent. That these dips are not just "sink holes" but are valleys in a system resembling a watershed has been demonstrated by a relief model made from elevations recorded on the map of a section of the workings in Stanaford No. 1 mine, Koppers Coal Division, Eastern Gas & Fuel Associates.

In doing engineering and map making for this mine over a period of 25 years, D. H. Meakin, of Stanaford, began to notice that the elevations recorded on the map indicated a definite pattern wherein every "low" place "drained" to lower elevation with respect to the general plane of the seam.

If that was actually the case he wondered if it might be possible in some way to predetermine the course of these valleys and take advantage of them in projecting the haulways so that they would cross fewer hills. After some years of intermittent discussion between the engineers and the men of the underground crews, in which some of the underground men were of the opinion that the swags were "holes" without a way out, Mr. Meakin decided to build a relief model.

This he did by using layers of 4-in. composition board, each representing 5 ft. of elevation-above sea level. For the horizontal scale he selected 100 ft. to 1 in. so that the pieces of composition board could be marked by using carbon paper on them and tracing the contour lines on them from the map.

As indicated in the illustration, the

finished job showed clearly that the low places are not "holes" but are valleys "draining" to "larger streams." Thus far, however, no practical way has been found of forecasting or following the course of the valleys so that haulage can be helped materially. Surface drillings on sufficiently close center lines would be too costly for consideration.

Invariably the coal seam is thicker in the swags. That gives support to an indication that the coal-forming swamp or at least the base deposit on which the swamp was formed covered an area which had been eroded by water. The vegetation naturally built up thicker in the low places, thus producing there a greater thickness of coal. This speculation is but one of many over which the engineer interested in geology and how coal deposits originated can ponder.

FIRES AND EXPLOSIONS

What Causes Them How to Prevent Them

Loss of Life and Property in a Mine Fire or Explosion Can Reach a Total of \$1,000,000 or More—Their Prevention Even More Vital in Time of War—The Principles Are Known and Need but Be Applied

WHAT WOULD a coal mining company be willing to pay for a mine fire or explosion? The answer is, naturally: "Nothing." Yet many coal companies have paid plenty for such disasters. And, it hardly is necessary to point out, explosions or fires are a dead loss from any standpoint. Perhaps the question might better be: "How much would a coal-mining company be willing to pay to prevent fires or explosions?" The answer might be in still another question: "What could an explosion or fire cost?" The figures below give a hint.

These figures, it might be said, have been exceeded many times, and million-dollar fires and explosions have been fairly frequent. A number have resulted in the destruction of the entire mine investment. And, in case it is not yet fully realized, it might be pointed out that while a coal company might not plank down a check for \$449,000 or \$55,000 for deaths and injuries following a fire or explosion, it nevertheless pays the cost eventually through higher compensation or insurance rates. The same is true of property destroyed wholly or partially.

WHAT A MINE EXPLOSION MIGHT COST

Fatalities (61 @ \$7,000 each).....	\$427,000
Non-fatal injuries (11 @ \$2,000 each).....	22,000
Cost of rescue and recovery.....	8,000
Replacement of equipment and reconstruction.....	40,000
Profit on production lost (50,000 tons @ 10c. per ton).....	5,000
Total	\$502,000

WHAT A MINE FIRE MIGHT COST

Fatalities (seven @ \$7,000 each).....	\$ 49,000
Non-fatal injuries (three @ \$2,000 each).....	6,000
Rescue work, firefighting, sealing.....	30,000
Replacement of equipment and reconstruction.....	48,000
Profit on production lost (250,000 tons @ 10c. per ton).....	25,000
Total	\$158,000



Coal mining must contend always with two naturally inflammable or explosive materials—methane and bituminous coal dust. In addition, man introduces other inflammable or explosive substances, such as powder, oil, rubber, cloth and wood, to recite but a few. Thus, the ingredients of a fire or explosion always are present and ready to be activated unless neutralized, eliminated or otherwise rendered harmless. To complete the picture, man introduces the igniting agents—open flames, electricity, etc.

Why, then, it might be asked, are there not more coal-mine explosions and fires? The truth is that there are many more than are generally realized. Small gas ignitions and small fires can be numbered in the hundreds yearly and each carries within it the seeds of a major disaster. Fortunately, not many reach the disaster stage, although it can be stated flatly that any disaster from these causes is one disaster too many.

What causes an explosion or fire? The ingredients are: (1) an inflammable or explosive material and (2) a source of ignition. As an ignition source, the electric arc ranks high in the list in coal mining, although it still meets plenty of competition from



Bureau of Mines photo

matches and smoking, open lights, other open flames or sparks and explosives used in blasting.

All the necessary ingredients must be present in the right conditions and proportions, however, before an explosion or fire is possible. Thus wood or coal, excusing spontaneous combustion, will not burn unless there is something to ignite them. Nor will gas or dust explode unless there is an ignition source. Contrariwise, gas cannot be ignited if it is diluted so that it is below an explosive concentration, and coal dust cannot be set off if it is rendered inert by combining with it, in the proper proportions, a non-inflammable material such as rock dust. Finally, gas or dust cannot be ignited if they are not present, and the same goes for other inflammable or explosive materials.

Protection therefore involves elimination or control of the condition of both the combustible or explosive materials and the source or sources of ignition. Thousands of words have been spoken or written on the prevention of explosions and fires, and much thought, money and time have been devoted to the problem. But the fact remains that the factors culminating in fires or explosions either are not

too well understood or are ignored or neglected, as evidenced by the continuance of disasters from these causes, in addition to the numerous ignitions and blazes which never reach the headlines because, fortunately, they never reach the disaster stage.

Gas or dust in the right condition and concentration, and a source of ignition are, as stated, the ingredients of an explosion. The precautions, therefore, are largely self-evident. Some of the more obvious ones, whose adoption will go far toward eliminating ignitions, are analyzed briefly in the following material:

Good Ventilation

Methane ignition by itself has caused the loss of numerous lives in coal mining. In addition, in bituminous mines, a gas ignition usually is a prelude to a dust explosion, although, of course, dust can be ignited directly.

By proper ventilation, it is possible to eliminate entirely the hazard of a gas ignition, although this does not excuse neglect of reinforcing precautions. What are some of the requisites of good ventilation?

1. A positive primary source of air with plenty of capacity at all times, plus all the necessary features for in-

suring operation without interruption.

2. Proper coursing of the air to make sure that at least the legal minimum is delivered to the face of each and every working place. This will include brattice lines or other positive directive mediums in essentially every active place.

3. Protection of the air current against the possibility of its picking up dangerous percentages of methane or other contamination before it gets to the point of use and eventually to the return.

In general, the percentage of methane in any return should not exceed 0.5. A slightly higher percentage may be permissible temporarily in a working place, but certainly if over 1 percent is found with any frequency there is a very good chance of a hazardous concentration occurring. Much more might be said on ventilation, but the practices which insure good ventilation are well known and if adopted not only eliminate the ignition hazard but also increase efficiency by improving working conditions.

Dust Elimination and Control

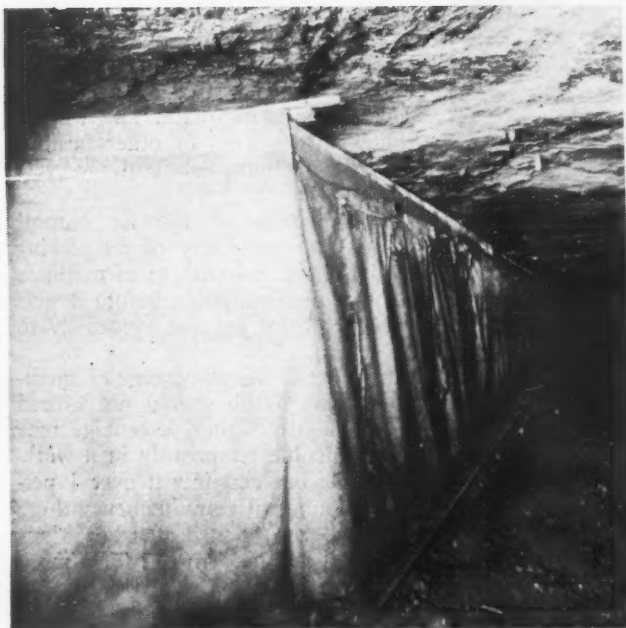
Coal dust, even more than gas, is the major destructive agent in bituminous explosions. It enters into and increases the violence of gas explosions unless removed or rendered inert. In addition, it can be ignited and wreak havoc in its own right. There are three main avenues of attack on this hazard:

1. Good ventilation—eliminates the chance of a gas ignition and thus makes a dust explosion less likely. Good ventilation also helps in reducing the dust concentration in the air in mine working places.

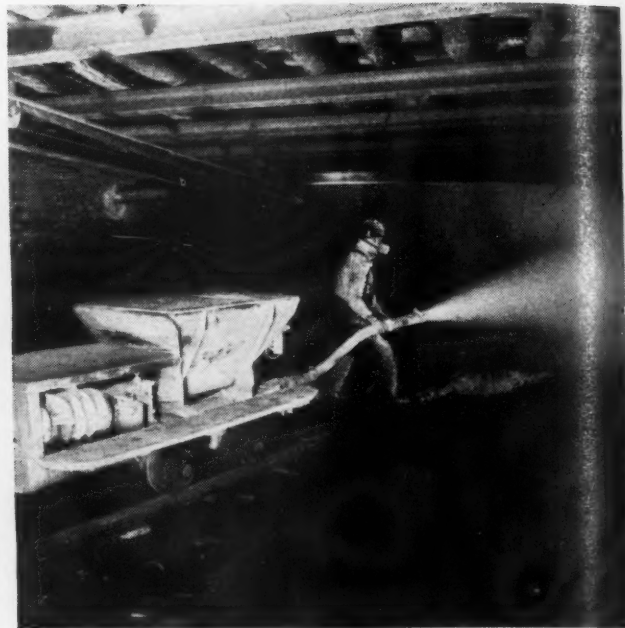
2. Reducing the quantity of dust produced and keeping it out of the air.

3. Making dust deposits harmless by rendering them inert, meaning rock-dusting.

Ventilation already has been discussed. Reducing the production of dust does not offer very many opportunities, but there are a number, including sharp cutter bits and tight cars. The latter, of course, prevent spillage of coal on the track where it is ground by men and equipment. Good cleaning up, which removes loose coal from the bottom and from roadways, is another dust reducer. However, it is fairly easy, and not unduly expensive, considering the benefits, to keep dust out of the air. Water is the best answer—water on the cutter bar; sprinkling of haulageways, cars, face and broken-down coal before loading; use of sprays at underground dumps, conveyor discharges and the like; and



Good ventilation clear to the working face is a vital factor in preventing gas or dust explosions.



Removing the coal-dust hazard by rock-dusting. Installation of barriers completes the protection.

similar measures. In addition, it is possible to provide, in many cases, special air splits for such dusty operations as dumping, insuring that the dust goes directly into the return or the outside, thus reducing or eliminating the hazard in such operations.

Sprinkling or other dust-control measures, however, must be backed up by rock-dusting, as it is impossible, otherwise, to prevent hazardous conditions. Therefore, rock-dusting must be done to the face and repeated often enough to keep the dust well below the explosive limit. And in rock-dusting, back headings should not be skipped because (a) they are out of sight and (b) it may be a little difficult to get at them. If regular rock-dusting is impossible, such openings should be protected by barriers. Barriers also should be installed elsewhere as needed as a secondary protection.

An important secondary protection against ignition of gas and dust is permissible equipment and materials. Such equipment and materials are designed so that if they are properly used the possibility of igniting accumulations of gas or dust is, for all practical purposes, eliminated. The list includes all types of mining machinery, motors, controls, lamps, explosives and blasting devices. Even "specially recommended" cables are available in normal times, although by its very nature no cable can ever be classed as "permissible."

In the field of machinery, the permissible type, although higher in first cost, normally is stronger, more re-

liable and less costly to maintain, thus representing a saving in the long run. Permissible explosives and blasting devices are available for breaking coal under all conditions at a reasonable cost, in addition to the safety improvements resulting from their proper use.

All new mining equipment should, by all means, be permissible, and in addition all companies would be well repaid by following the "Ohio Plan" of gradually retiring all non-permissible units over a moderate period of years, meanwhile adopting all the other accepted safeguards.

If the principle of permissible equipment is adopted, open lights naturally go into the discard, thus removing a prolific source of ignitions resulting in explosions and fires. But as long as matches and smoking are permitted underground, one big loophole remains open. The hazard of both fires and explosions warrants a complete ban on smoking and matches in coal mines. They have definitely been proved to be dangerous and so should be no more tolerated than any other hazard.

Good Housekeeping

Man himself, as stated, adds to the potential hazards of mining by introducing additional flammable or explosive materials. Wood is an example, and it is difficult to see how mining could be conducted without it. However, there are many places where its use creates unnecessary hazard, as, for example, in substation construction. Wood anywhere where there is

electricity is definitely dangerous. Either some other material should be employed or operations rearranged to eliminate the necessity for the structure, such as a mine door.

But other things besides wood are inflammable and, under proper conditions, even explosive. Oil and grease are examples. The answer with all such materials is to handle, store and use them with all the respect due their hazardous potentialities.

The observations just made lead inevitably into good housekeeping. A clean, orderly mine, where materials are handled properly and trash is not allowed to accumulate, is well on its way to being safe from fires and explosions, especially if structures are made fireproof or at least heavily fire-retardant.

Firefighting Equipment

Few storekeepers or manufacturing establishments would think of operating without some type of firefighting equipment, even if laws and insurance regulations would permit. But there are many coal mines with little or no equipment with which to extinguish a blaze if one should occur.

Extinguishers on all equipment, in all substations, underground shops and other departments, and for all surface structures, certainly are the first line of defense. Extinguisher stations in the various working sections where larger capacity units or depots can be located is the second line. To this should be added fire trucks, rock dust and sand cars, tool and supply cars



Permissible equipment and materials reduce the hazard of gas or dust ignitions. The water tank and spray equipment accomplish another objective—dust suppression.

and other equipment for firefighting.

The firefighting mediums in coal mines, in addition to water, include sand, rock dust, chemicals and carbon dioxide. Water, however, is out of the question in fighting fires where electrical equipment or circuits are involved, while chemical extinguishers give off poisonous gases and fumes when played on hot metal, as is often the case in any fire involving equipment. Carbon dioxide is an excellent medium for fighting any kind of fire, although long-continued use in a confined space may reduce the oxygen content below a life-sustaining level. Large coal fires have been extinguished by sealing and drowning them with carbon dioxide or by smothering them with rock dust applied, among other methods, by high-pressure rock-dusting machines.

The three most applicable firefighting mediums in coal mines therefore seem to be:

1. Water—where electrical equipment and circuits are not involved. The source may be a sprinkling or pipeline system or portable, semi-permanent or permanent pumping units drawing from either water boxes or sumps, ditches or ponds if close enough.

2. Carbon dioxide—for either large or small fires of all types. It may be obtained from cylinders, extinguishers or Cardox tubes, with tanks, especially on the outside, as another possible source. "Dry ice" in solid form also has been used in extinguishing mine fires.

3. Rock dust—for either large or small fires of all types. The dust may be applied by hand, shovel or through the medium of rock-dusting machines.

Keeping proper extinguishing equipment and materials on hand and in usable condition may mean the difference between a small blaze soon put out or a large conflagration which may cost a number of lives and thousands or hundreds of thousands of dollars in property damage.

Preventing Electrical Fires

Aside from its presence as the ignition source in many explosions, electricity is perhaps the worst offender in the half dozen or so principal causes of fires underground, as well as on the surface. While not all of the measures that can be taken to prevent electrical fires will also prevent explosions from electrical ignitions, a great many will serve the double purpose. And when the necessary additional precautions are taken, as outlined earlier in this article, freedom from explosions is assured along with elimination of fires.

Coal mining's lifeblood these days is electricity. But the use of electricity must be accompanied by a proper appreciation of its hazards and acceptance of the responsibility for neutralizing or eliminating them.

Power lines and electrical equipment are almost everywhere in modern coal mines—in shafts, slopes, drifts and many mine passageways to the working face—in addition to surface applications. The conductors are

mounted or carried in every position on the roof, ribs, and bottom. Among the inflammable materials present are wood, coal, coal dust, gas, lubricants, rubber and fabric hose, curtains and brattice cloth, clothing and trash of various sorts, including cotton waste, rags and paper. In some instances, explosives are stored fairly close to electrical equipment.

Trash, of course, should not be allowed to accumulate; greasy materials can be kept cleaned up; explosive mixtures of methane can be avoided by proper ventilation; coal dust can to a large extent be controlled by elimination or rendering it inert, and rules can be made to prevent workers hanging jackets or other clothing or inflammable material near electrical equipment. But there remain a number of combustibles: coal; wood in ties, timber doors and other structures; lubricants, curtains, explosives, hose, belts and electrical insulation; their presence calls for never ending care in purchasing, installing and maintaining electrical equipment.

Of the various voltages for mine entrance lines and cables, 2,300 and 4,000 need closest attention. The fire danger is remote in boreholes but to prevent ignition or propagation of flame, or pulling smoke and fumes into the mine, the tops of the holes should be sealed against air circulation. At the bottom, the casing should extend down several inches below any top coal and particular attention should be paid to installing an insulating cushion or otherwise preventing the cable from chafing against the edge of the casing as a result of expansion and contraction or other influence.

In shafts lined with wood or in wood-timbered slopes, wire-armored cables are safest because of a degree of mechanical protection against wrecks or falling objects, but use of the trench-lay types for many jobs is safe and feasible if properly installed and protected. It is evident that all cables should be installed, if possible, where there is no haulage or danger of falling objects and that they should be properly protected by inclosed fuses or breakers.

Handling Shaft Wiring

In any air or escape shaft not containing any wood and with no exposed coal or other combustibles at the bottom, bare copper wires or cables widely spaced are a possibility and at least have the advantages of not introducing a combustible (the insulation) in an otherwise fireproof shaft. That type of installation, however, might prove unreliable where ice accumulations are heavy and

should not be considered in the return air shaft of a gaseous mine.

Type of cable to be used and where it will be installed for 2,300- and 4,000-volt horizontal runs must depend to some extent on conditions. In the cases of rib or roof installation, it is best, from the standpoint of wrecks, to keep them out of haulways. However, if the mine roof is very weak and the aircourses are not well timbered, compared to substantially timbered haulways with heights of 8 to 10 ft. or more, the haulways might be the better choice.

Cable buried in a trench and surrounded by sand or other non-combustible material surpasses open-hung cables from the standpoint of fire protection. Boxes containing circuit breakers and/or splices and disconnect switches between cable sections should be well back in rib holes lined with brick and having doors of the bolted or locking type which fit tight enough to prevent sparks flying out.

Sectionalizing oil circuit breakers, if of the ordinary type, should be in a fireproof room, chamber or cell. All breakers should have ample interrupting capacity, for it is a mistake to expect a toy-sized breaker to do a man-sized job. Totally inclosed oil circuit breakers are available which will permit the escape of gases without discharging oil.

Making Transformers Safer

Transformers with non-inflammable cooling liquids and also air-cooled transformers are available to get away from the dangers of oil-filled transformers underground, but apparently many of the oil-filled type will remain in use underground for many years to come. In all cases the room, cell or portable box containing them would be fireproof with a tight bottom or a dam to confine spilled and flaming oil. Such a room, cell or box also should be fitted with a steel door which will close automatically in case of fire. Many companies have fitted substations, transformer and oil switch cells, and portable transformer boxes or tanks with such protection.

Use of oil-filled transformers underground has never been smiled on by the U. S. Bureau of Mines but the Bureau has not seen fit to give the non-inflammable-liquid type a complete O.K. either. While the latter type will not start or sustain a fire it is known that in case of internal electrical failure it is possible for the liquid to give off irritating fumes containing chlorine. Absorber attachments are available, however, to prevent escape of toxic gas.

Open wiring with inflammable cov-

erings and in tangled and loose disarray back of switchboards in d.c. substations, in transformer substations and at stationary motors and starters at least should be straightened out into systematic runs so that there is less chance for flame from one wire communicating to another wire directly above and to discourage accumulations of dust and dirt. Closely grouped wires, of course, should have flame-resisting coverings but at this time large-scale replacements may be difficult. However, every attempt should be made to carry out such work. The same applies to installations of metallic conduit to revamp old open wiring.

Protecting Substations

Several other points of danger are likely in d.c. substations. Fused disconnects should be mounted free of wood or other inflammable material and that type of material kept away from the floor beneath. Oil seepage or siphoning from converter transformers should be corrected or steps taken to prevent any accumulation on the floor or on wires. The starting oil switch of a motor-generator, especially if manual and subject to abuse, should be inspected frequently (about once a month) to insure that the contacts are kept in good condition and that proper oil level is maintained. The switch should not be adjacent to or directly under a bunch of wiring.

The converter or motor generator may be over a pit out of which conduits go to the control board. Tiny leaks of bearing oil together with dust, lint or other combustible may accumulate under or around the leads, especially if they lie on the bottom of the pit, and a spark from a commutator flash may set the accumulation and leads afire. The wires should be blocked up off the floor, the leak stopped if possible and utmost cleanliness practiced. It should be remembered that substation circuit breakers may, when operating under heavy short-circuit conditions, throw sparks many feet. Cotton waste, clothing and all other combustibles should be kept out of the room or in spark-tight cans, boxes or lockers.

Underground substations and transformers are subject to lightning damage and a resultant fire hazard if installed within relatively short distances (100 to 1,500 ft.) of the point where the power leaves the pole line and starts underground. Adequate installations of lightning arresters at the last pole and in the substation greatly minimize the danger.

On mobile underground machinery, accumulations of grease and dirt around leads on, for instance, cutting

machines, loaders and locomotives, cause and contribute to electrical fires that knock equipment out of service and give off dangerous smoke and gases. Such fires, also, can flare high enough to ignite wooden crossbars and top coal. Unless the exposed wires and leads have oil-resisting braids the grease may cause a rapid deterioration of the insulation that will result in a ground or short that starts a fire. On certain types of machines leakage of the oil-hydraulic control system can be a factor in saturating insulation.

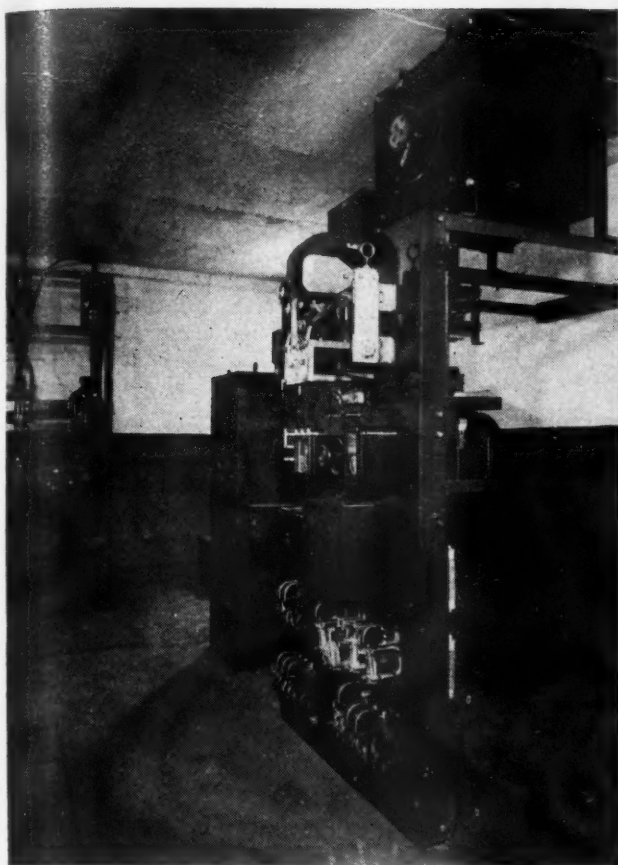
Use of permissible equipment and maintaining it in that condition is a solution of many of the fire hazards. Only the flexible connections constitute a degree of danger, chiefly in case of a wreck or damage from a fall of roof. On the older equipment, repairing oil leaks, rewiring with oil-resisting cable, rearrangement of cables, installing duct or loom protection, and frequent inspection and cleaning are the remedies.

Portable power cables and trailing cables cause fires by arcing at bad splices, shorting, grounding and by total overheating when feeding a prolonged short or ground in a machine. Making good temporary splices, replacing them with vulcanized permanent splices as soon as possible and proper fusing in distribution box, junction box and nip constitute the principal precautions that should be taken. In conveyor mining, some companies which formerly hung the surplus length of room cable on pegs set in posts now leave this live cable on the mine floor because the fire hazard appears to be greater when the cable is up in the air current.

Insuring Trolley Safety

Trolley wires are one of the worst offenders in setting mine fires. Proper construction and maintenance greatly minimize the hazard, but since roof falls may bring down any wire, the sectionalizing breaker is a necessary protection. Breakers of the automatic reclosing type should protect every substation and main feeder. That same type, or manual air circuit breakers, should be installed to protect every branch trolley and feeder. Air breakers having time delay tripping for overloads and instantaneous tripping for short circuits are now available at relatively low cost compared to the heavy-duty automatic reclosing breaker.

To afford greatest security, trolley wires and feeders must have strong dead ends including the best available strain clamps. Insulated hangers and other attachments should fit the wire properly and be anchored as securely as conditions permit. Trolley wires



Good construction and good housekeeping go far toward eliminating the electrical fire.



Preferred construction for electrical installations—fireproof housing with door to confine fires or sparks.

should, by all means, be kept free from contact with mine doors, timbering, coal, roof, ribs, gob piles, wood brattices and curtains. There is no telling when conditions will change and turn a harmless contact into a fire maker.

Sparks from trolley wheels are potential fire setters, for there is the chance that a spark will land in a greasy rag, waste paper, dry and rotten wood, lumber, chips or shavings in a supply car, men's clothing and the like. While maintaining trolley wires in tight condition is a necessity and keeping the wheels in good condition further minimizes sparking, the best solution is the exclusive use of shoes or gliders. To reduce wear and further promote sparkless operation it is well to condition the trolley wires by applying graphite and carbon tetrachloride once a month or so.

Arcs and sparks from bad rail joints constitute a real fire hazard and, fortunately, this hazard is almost eliminated by good bonding—unless a bond and a cross bond are broken by a car jumping the track. Welded rails for main lines make the safest track, but even so a rail could break and cause an arc. Wooden ties plus tracks covered with spilled coal can be

the ingredients of a full-scale mine fire.

Sparks from wheels and rails due to oversanding can light a piece of paper or rag which can ignite a splinter of wood and the splinter in turn can communicate flame to a tie or coal. Continued use of so much sand as to cause severe sparking usually is an indication of a low operating efficiency that should be rectified by grading, hauling fewer cars per trip or using a heavier locomotive.

Bulbs Can Cause Fire

Even the electric-light bulb can cause a fire. An instance is known where a high-wattage bulb set fire to a mine prop because something caused a wire hooked over a nail to loosen and let the bulb swing over against the wood.

Charging of batteries also can be a source of fire, especially if the charging is done directly from the trolley circuit, for in that case there is full line potential of 275, or whatever it may be, acting on the battery insulation to ground. Charging from special motor-generator sets, insulating the charging stand from the ground and maintaining cleanliness around the cells and trays are the remedies.

All mine officials and section foremen should be reminded often that in the electrical system lurks an unseen demon that is "just aching" for a chance to jump out of bounds and produce extreme heat. The maintenance man who has general charge of electrical equipment should have time to give fire prevention frequent attention. Inspections of all electrical lines and equipment from the fire-hazard standpoint should be made every two or three months.

But mine officials, section foremen, electricians, safety directors and others are not the only ones who should be conscious of the hazards of fires and explosions. The responsibility goes right to the top, and management likewise must give heed to making coal mines as free from such disasters as possible. Fires and explosions cost money. They take lives and interrupt production. Now, when every man and every ton is needed for the war effort, is more than ever the time to work for their elimination. Coal mining has the "know how" and the savings in human suffering, destruction of property and loss of tonnage are self-evident. All that is needed is the necessary effort.

COAL INSPECTION

Geared to Quality at Orient Mines

RECOGNIZING the value of controlled uniformity and a record on every car loaded, the Chicago, Wilmington & Franklin Coal Co., West Frankfort, Ill., has developed a system of coal inspection planned to give it the pertinent facts. The system provides data for the company files, maintains production standards, reduces complaints, and supplies a basis for handling complaints that do arise.

For obvious reasons, the function of inspection is completely apart from production. It is a part of and under the direction of the sales department. However, production and sales departments cooperate to maintain standards of size, quality and a check on car numbers and grade of coal in each car.

Under the direction of Chief Inspector William Shutt is a force of twelve men. Three are assigned to the chemical laboratory at the New Orient mine, six inspectors to the same mine, and three inspectors to Orient No. 1.

The nine inspectors start the day with a pad of report blanks and spend their entire time at the tippie watching the cars, the coal and the loading. The empty-car condition is first noted on the report, along with the weather. The car may have a broken floor, cracks or a bent door that would leak coal without the wooden slats, boards or paper used to close the openings. The number of such boards is noted in the report.

Cars of lump or egg coal may have a showing of sulphur, blue band or bony coal. These are all noted in the inspector's report and the cars graded. Coal not acceptable is switched back to a dumping point for crushing and reparation.

Coal below 2-in. is screened into a variety of grades, including stove, chestnut, pea and carbon. These small sizes are binned separately, to be loaded out as such, or blended into special mixtures. This small coal may be washed or unwashed, according to the equipment of the mine or to meet the specifications of the buyer. The carbon may be further separated into three sizes, $\frac{3}{4}$ -in. x 10-mesh household stoker, a special product of this company; 10 x 48-mesh and minus 48-mesh.

From these binned sizes, mixtures are assembled on a conveyor to be discharged into the railroad car as a blended product. In this manner screenings are put together using definite quantities of coal from each bin, so that a uniform mixture having consistent burning qualities is assured in each carload. In the event one bin runs "dry" while loading a car, a merco switch operated by a paddle inside the bin turns on a signal lamp, and loading is stopped until coal of that size is available. This assures uniformity of the assembled mixtures.

Degradation from all sizes of coal

down to $\frac{3}{4}$ -in. is returned to the coal flow for resizing. To reduce degradation in the car being loaded, egg and lump booms are dropped down near the car bottom before coal flow is started. Regardless of the care used in loading, bumping and weaving of the car in transit and the settling of coal in the car grind off some fine pieces of coal.

The loading rate of the tippie is somewhat faster than the hoisting rate. This permits time for car changes and other slight delays. Each individual loading boom, conveyor or chute is stopped during a change.

At intervals of about 1½ hours, the several inspectors turn their reports over to the weighmaster. He checks the car numbers and the kind of coal with his own records for periodic relay by telephone to the billing clerk.

The analyses of the various grades of coal are a running commentary on the quality of coal produced. They serve as a guide for the operation of the preparation facilities and for the records of the company. The company runs its own proximate analyses. Screen analyses are run on stoker and other sizes. These are made with Rotap screens. The laboratory for both operations is at New Orient mine.

This inspection system is the outgrowth and development of a one-man beginning nearly 20 years ago. It is believed to have justified itself.



Orient No. 1—one of the two C., W. & F. preparation plants. Coal inspection at both is designed to insure quality and uniformity.

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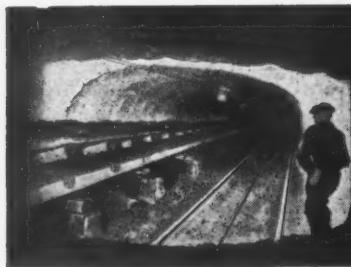
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will add to any
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- 1** Keep adding approved water at regular intervals. Most local water is safe. Ask us if yours is safe.
- 2** Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.
- 3** Keep the battery fully charged—but avoid excessive over-charge. A storage battery will last longer when charged at its proper voltage.
- 4** Record water additions, voltage, and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Compare readings.

If you wish more detailed information, or have a special battery maintenance problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for booklet Form 1982.

BACK THE ATTACK—WITH WAR BONDS



THE FOREMEN'S FORUM

Should Sprags Be Used in Undercut of Coal To Keep Mine Roof From Falling?

WHEN MINING MEN use sprags they do it usually as a safety provision, advocating their use because they keep the coal from falling prematurely and injuring face men and others. However, they may be used also to keep a drawslate in condition so that it will continue to stay in place after the coal has been withdrawn and until such time as the roof can be posted; hence it may have an economic as well as a safety value. That is, it may enable us to avoid handling the slate as well as to save lives and limbs. D. W. Phillips, mining engineer, (British) Safety in Mines Research Board, has been urging the use of the sprag to delay the weakening of the drawslate so that it can then be posted, crossbarred and supported by wood chocks or packwalls.

When the drawslate is at all fragile, effort should be made to retain it by applying sprags as soon as coal is undercut and removing them one by one, breaking down the coal immediately after each sprag is removed. In some cases, where the coal is friable, the drawslate is creviced even before the coal is brought down and, if the coal sags, its parting from the roof occurs not in the coal but in the shale above it, so that the miner finds he has a lot of "following stone" to pick out of the coal and throw back into the gob. Without the preliminary break, he may be able to hold it in place and not handle it all.

Undercutting a 6-ft. 5-in. seam for a depth of 6 ft. in a room 30 ft. wide will develop a shelf of coal weighing about 40 tons supported only at the back and sides. If the coal is at all friable, the shelf will be incapable of self-support and may sag or fall. If it clings to the mine roof or, to use mining parlance, if it is "burned to the roof," it will try to drag down the roof with it and, if that roof, as often is the case, is weaker than the coal, it will sag or fall with the latter. If, however, the coal can be supported by sprags and brought down in sections, the roof in a degree will be protected.

After the coal has been brought down,

the roof, no longer burdened with tons of coal, may be able to stay up until posted and crossbarred unless the spragging may have strength (resilience) enough to enable the sagging roof to correct part of its sag and return almost to its original position when the weight of the coal is removed. It is reported that when hydraulic pressure forces down coal some inches, as occurs when a hydraulic pump with "coal burster" is applied, the coal, as soon as the pressure is removed, sometimes will rise again and close up its crevices. There may be, of course, other loads than those of the weight of the coal shelf or slab, but these have not been considered, for they exist not only while the shelf is in place but also after it has been taken down.

However, the recommendation of Mr. Phillips that spragging be used in all cases in Great Britain for roof as well as coal support seems to suggest that the sprags should be used even where the coal is not fragile and where the weakness of both roof and coal arises more from roof pressure on the coal slab and on the immediate roof above it than from the weight of the coal slab itself, though that pressure, such as it may be, will continue after the slab is removed.

In that case, the roof will be unprotected as soon as the sprags are knocked out, and the value of the sprag will be derived (1) from a shortening of the time during which the roof stands unsupported by any timber support and (2) by the fact that the slab never has to support, unaided by a sprag, both the roof pressure and its own weight. It would seem, therefore, that these same reasons will explain why the sprag is helpful, even when the coal is reasonably resistant to breakage and even when the roof does not cling to the coal but tends to be forced down when the coal descends or is removed.

Most of the British coal is under heavy roof pressure, as the mines are deep and the coal also probably is no more fragile than our own. Pickhammers, that are used

where the coal is fragile, have never been as popular in Great Britain as on the Continent of Europe, apparently for that reason. So if sprags have value for roof support in Great Britain, they should have value here, even with fairly strong coal and with a roof which readily frees itself from the coal bed and does not attempt to support it. It should be remembered also that with an infinitely slight downward movement, the drawslate will divest itself of the pressure of the main roof at the vertical plane over the back of the undercut, and, even at the face of the unshot coal, the main roof probably does not press on the coal.

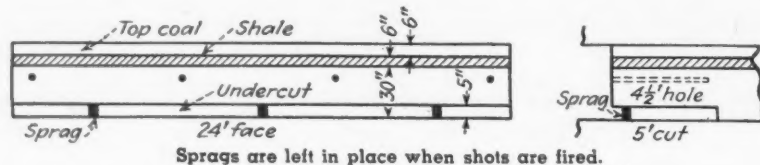
Comment by R. W. Scollon, chief engineer, Peale, Peacock & Kerr, St. Benedict, Pa.—In one of our mines we have a layer of bad shale on top of the main body of the coal seam with about 6 in. of top coal above the shale, so that the latter tends to fall with the shot coal. In some places this shale will break away from the top coal regardless of precautions we have taken, but in most cases we have been holding it by shooting with the sprags still in place. We have tried shooting one shot at a time and removing the next sprag before the succeeding shot, but find that the coal at times will break loose without shooting as soon as the next sprag is removed and then has to be drilled and shot from the bottom. This method gave such variant results that it was abandoned, so at present we are using only one method: that is, shooting with all sprags in place (see illustration).

A stick of duPont C C permissible is placed in each hole and all shots are fired without removing sprags. The spacing of holes and sprags shown in sketch is only approximate. In some places where the shale is more likely to fall, sprags are placed nearer to shots, and four sprags are used instead of three.

How Air Can Be Dried by Water Before It Enters Mine

Many persons have wondered how water can be removed from air by sprinkling the air with water, and many do not believe that it is so removed and say, therefore, that it is not the dryness of the air admitted to the mine that prevents it from destroying the roof but its evenness of temperature. However, it is a fact that the moisture in air often is reduced by sprinkling the air with cold water, and so in a sense the air is dried by water.

To make this clear, let us suppose we have a bucket that will contract consid-



Sprags are left in place when shots are fired.

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erably with heat, and we fill the bucket with water. If any more water at the temperature of the bucket is added after the bucket is full, the water will merely run away. But if the water is cold, it will contract the bucket, and it will hold less water, so that the addition of water actually will deprive the bucket of water, and it will hold less water than before. Air is like a contractible bucket; it will hold less water vapor when it is cool.

Consequently, if the air is full of water vapor—that is, if it is “saturated”—and if then it is cooled by spraying it with water, it can take up no more water as a vapor or gas and must spill what water is added and, when it contracts, as it does when sprayed, it can hold less water vapor and must spill that also, so the addition of water makes it drier as far as water vapor is concerned, though there may be more liquid water in the air.

This liquid water—“water,” as it is said, “in the liquid phase”—can be removed by making the air strike vanes (or eliminators,” as air-conditioning experts term them). These two kinds of free liquid water, the water from the sprays and the water that the air can no longer hold as a vapor or gas, collect on the vanes and drop down in a steady stream, leaving the air carrying all the water it can carry at the temperature to which it is cooled. If then its temperature is that of the mine into which it passes, it cannot deposit any water on the roof or pillars of the roadway. Thus, wetting the air prevents the mine from getting wet.

However, saturated air—that has all the water vapor it can carry—will give up a lot of water to certain salty substances, but far less to rock and still far less to coal. Also if, in the mine, the air gets heated, it will expand and will then take up water from the mine and actually dry the workings, and this is what happens in deep hot mines.

That the air actually is dried by sprinkling it with cold water can be proved by noting how, in summer, beads of moisture form on the roof before sprinkling commences and disappear after the air is sprinkled. Some water, undoubtedly, is removed from the surface of the roof by the capillary action of the rock, which causes the water to travel upward in the roof for some inches.

Safety Joe Tries to Scale No-Accident Ladder

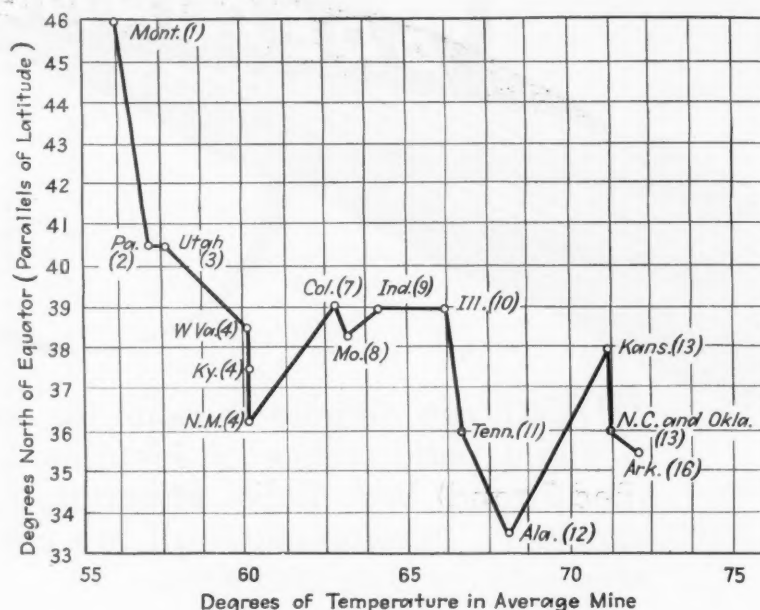
A little wooden man known as “Safety Joe” has been placed by the officers of the Third Army Air Forces Storage Depot on a yellow 26-rung ladder, each rung representing one day in a month of working days, says the *O.I.C. Monitor*. Whenever a day passes with no lost-time accidents, Joe takes a step upward on the ladder and, if there is such an accident, he falls on his back onto the ground but starts his climb again as soon as another day passes without a lost-time accident. If he should reach the top of the ladder, he stays there until another lost-time accident precipitates him to the ground. Electric lights illumine his progress for the night shift.

Mine Temperatures Are Quite Irregular But Mount 16 Deg. Toward South

MANY FACTORS determine the temperatures of mines—the maturity of the coal (“maturity” surely is a preferable word to the more generally used word, “rank”), whether the mine is shallow or deep, whether it is adequately or inadequately ventilated, whether it has been long in operation or has been only newly started, whether it is located at high or low elevation, whether it is traversed by cool or heated waters and dependent on the quantity of these waters present, whether mine fires, geological disturbances or residual volcanic heat are raising the temperatures, whether bacterial and chemical metabolism (change of substance) are active and whether the mine is located near or far from the equator. There may be other factors also.

This article, however, refers mainly to the last factor mentioned, though it is not

usually the main determinant of temperature. However, Montana and Pennsylvania in the north show the lowest temperatures, and Arkansas, North Carolina and Oklahoma, States of low elevation and located in the South, show the highest. Alabama, despite its location on a high plateau, has warmish mines. The range of average temperatures is 16 deg. F. Ruling out Montana and Arkansas as imperfectly determined by the one observation made in each case, the range becomes 14 deg., which is in accord with what one might expect. The dry-bulb thermometer reading is taken because that is the actual mine temperature, being unaffected by the moisture in the air. Evidently, even at depth, mine, and possibly rock, temperatures also are affected by the mean annual temperature of the atmosphere at the surface.



Graph shows relation of temperature to distance in degrees from equator.

AVERAGE DRY-BULB TEMPERATURE AT U. S. COAL MINES BY STATES

Order	State	Temperature Deg. F.	Number of Mines Where Temperature Was Noted	Approximate Degree of Latitude
1.	Montana.....	56.0	1	46°00'
2.	Pennsylvania (complete extraction).....	57.0	13	40°30'
3.	Utah* (for many years indifferent extraction)...	57.5	8	40°30'
4.	West Virginia.....	60.0	9	38°30'
4.	New Mexico (high land).....	60.0	3	36°15'
4.	Kentucky.....	60.0	13	37°30'
7.	Colorado (includes probably one mine, Somerset, with residual volcanic heat).....	62.7	18	39°00'
8.	Missouri (incomplete extraction).....	63.0	3	38°15'
9.	Indiana (incomplete extraction).....	64.0	14	29°00'
10.	Illinois (incomplete extraction).....	66.0	11	39°00'
11.	Tennessee (incomplete extraction).....	66.5	1	36°00'
12.	Alabama (high plateau).....	68.0	12	33°30'
13.	Kansas (shaft mines).....	71.0	1	38°00'
13.	North Carolina.....	71.0	1	36°00'
13.	Oklahoma.....	71.0	10	36°00'
16.	Arkansas.....	72.0	1	35°15'

From “Falls of Roof in Bituminous Coal Mines—Influence of Seasons and Rate of Production,” by J. W. Paul, Technical Paper 410, but rearranged. Latitude and order columns have been added. Former is based on knowledge of location of coal fields of the State but not on knowledge of mines where samples were taken in States indicated.

* Above 8,000 ft. above tide. Probably includes one mine, Kenilworth, with a prehistoric fire in coal seams above seam being worked.



Belting and Hose with a Thumb



The thumb gives man his mastery over animals—his control of physical activity. The thumb symbolizes power and capability; strength put to work.

We say "Belting and hose with a thumb" because this statement best expresses the extra something that distinguishes Thermoid belting, hose and other industrial products. The engineers who design these products, and the production specialists who build them, have a realistic viewpoint that takes end-use problems into consideration. Beyond the belting and the hose, they see the tasks to be performed in the transmission of power and the movement of material.

This approach results in products that establish outstanding performance records . . . products that are born with the extra serviceability

symbolized by the thumb. When "Thermoid" is on the products, everyone from the President down knows that the Purchasing Agent is buying the very best that can be had.

P.S. In line with material conservation, Thermoid has prepared a series of bulletins on how to extend the life of rubber products now in use. You might find them helpful to be passed on as reminders to your operating people. Feel free to ask for copies.

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IT'S GOOD BUSINESS TO DO BUSINESS WITH THERMOID



STATE-BOARD QUESTIONS

Quiz for Pennsylvania Bituminous Firebosses

What Must a Fireboss Be?

Q.—What are the legal qualifications for a fireboss?

A.—Any applicant for a certificate of qualification as fireboss shall be a citizen of the United States, of good moral character and of known temperate habits, at least 23 years of age and shall have had, after arriving at the age of 16, an aggregate of at least 5 years' practical experience as "miner, mining engineer or man of general work" inside the bituminous mines of Pennsylvania. However, "a graduate in the coal-mining course of a recognized institution of learning," after examination, may be granted a certificate of qualification by the examining board as fireboss if possessed of an aggregate of not less than 3 years' practical experience as a miner or man of general work inside the bituminous mines of Pennsylvania. An applicant for a certificate of qualification as fireboss also must have had experience in such bituminous mines of Pennsylvania as generate explosive gas.

He must be able to read and write the English language intelligently and must furnish the board with certificates as to his character and temperate habits, which certificates also shall show his length of service in the several mines in which he was employed—Art. XXIV, Sec. 6.

(2 percent)

Q.—What should be the physical qualifications of a fireboss?

A.—He must have good eyesight, good hearing and should have a keen sense of smell and be physically able to perform his work.

(1 percent)

What Must a Fireboss Do?

Q.—What are the legal duties of a fireboss?

A.—Before his shift enters the mine, he is required to examine carefully every working place without exception, all places adjacent to live workings and every roadway, also every unfenced road in the mine leading to abandoned workings and falls, but, before proceeding with the examination, he must see that the air current is traveling in its proper course. He must use no other than an approved safety lamp, must begin his examination within three hours prior to the appointed time for his shift to enter the mine, must examine for dangers in all parts of the mine under his charge, after which examination he must leave a record of the date of his

examination at the face and at the side of every place examined.

After examining for all dangers he must place a danger signal across each entrance to every working place and every other place where explosive gas is discovered or other immediate danger is found. He must enter a report also in the mine record book with ink (giving the date of the examination*) the time taken in making it and the nature and location of any danger observed, reporting the same verbally to the mine foreman.

The fireboss must make, during working hours, a second examination of every working place and report such examination in the fireboss' report book. He, moreover, must assist the mine foreman in erecting a permanent station with proper danger signal at or near the main entrance to the mine, or other place approved by the State inspector where the workings are a mile or more from the bottom of shaft or slope. This he shall designate by suitable letters and colors placed thereon, prohibiting any person except the mine foreman (or persons, in case of necessity, designated by that official) from passing beyond said permanent station and danger signal until the mine has been examined by a fireboss and the mine, or certain parts of it, have been reported by such authority to be safe. He shall not allow any person to enter or remain in any part of the mine through which a dangerous accumulation of methane is being passed, and he shall report any violation of this article to the mine foreman.—Art V, Sec. 2, 3 and 4 (3 percent).

Q.—State at what points the law requires that danger signals be placed.

A.—Danger signals shall be placed "across each entrance to every working place, and every other place where explosive gas is discovered or immediate danger is found to exist from any other cause," which includes, of course, worked-out and abandoned places.—Art V, Sec. 1; also Art IV, Sec. 11. Also at the permanent station until the firebosses have completed their examination and declared the section safe where the man in question travels or works.—Art. V, Sec. 4. Also across the mine entrances whenever operations are temporarily suspended at a mine.—Art. IV, Sec. 14. (3 percent)

* Omitted in law.

Q.—State when danger signs should be placed.

A.—Danger signals should be placed as soon as danger is found, as promptly as places are worked out and abandoned, as soon as the fireboss enters the mine to begin his examination and concurrently with suspension of mine operations. (2 percent). They should be so placed that persons cannot enter the endangered area without coming into contact with the timber on which the signal is displayed, thus having their attention arrested and directed to that signal.

Q.—When and by whom should the removal of danger signals be authorized?

A.—Danger signals should not be removed until the dangerous condition has been corrected or has disappeared. Such signals should be removed by the mine officials or by some person authorized by the mine foreman. (2 percent).

Cure for Electric Shock

Q.—How should first aid be rendered to a workman suffering from electric shock?

A.—After the victim of electric shock has been released from the wire, turn him over on his face, remove all foreign bodies from his mouth, and pull his tongue forward and prevent him from drawing it back. Turn his head to one side, resting on his forearm so that his mouth and nose are not in contact with anything that will interfere with breathing when once established. Extend his other arm forward.

Loosen the clothing around the neck and start immediately the Schaefer method of artificial respiration (see Coal Age, March, 1942, p. 65) and continue without cessation until the patient recovers or is pronounced by a physician beyond recovery. Heat-giving articles placed about the body will aid the patient's recovery, but don't overheat the patient and be careful not to burn him. The mines are cold and warming the patient's body and conserving the heat it contains is a most important factor in recovery from shock. The error in the mines usually is in not providing enough heat. At the same time, it is wonderful what a little cool air on the face will do to revive a patient, so don't overdo the warming process. (2 percent)

Approved Safety Lamp

Q.—What is an approved safety lamp?

A.—Any bonneted safety lamp approved by the Secretary of Mines.—Art. 1. (2 percent).

This "War Machine" will never see the front!



Giant shovels like this one are playing a vital role in our nation's coal production ... with the help of electricity and dependable wires and cables to carry it.

TO KEEP coal production steady, operators use large quantities of electrical power...delivered through modern research-built wires and cables like Anaconda's tough, rubber-saving Duracord* and it's all-rubber companion, Sunex Securityflex*.

Of particular interest today with the conservation of rubber all-important, is Duracord. This construction was developed during the last war to meet the need

for super-strength cords and cables. Its "fire hose" jacket, woven from long fiber cotton, makes Duracord tough on the outside—the weak spot in most cables.

The Duracord jacket makes possible rubber savings as high as 50% without

sacrificing any efficiency. For further information, please write us immediately. 42253

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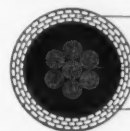
This familiar trade-mark symbolizes the best efforts of modern research and production.

ATTENTION

Save Rubber with **DURACORD**
without Loss of Efficiency

Here's a way you can effectively conserve rubber supplies and still get long-lived heavy duty electrical cords and cables ... use Duracord.

This construction has served in some places for more than twenty years and it is still in use today. It is *not* a new construction.



FIRE HOSE JACKET

COPPER CONDUCTOR

RUBBER INSULATION



Sunex Securityflex and Duracord

ANACONDA WIRE & CABLE COMPANY

To Avert Methane Explosion

Q.—If, while making the second examination of a section, you observed a large body of methane on a goaf (gob) fall, what action would you take?

A.—I would have all lines supplying electric power to the affected part or parts of the mine deenergized and all men re-

moved, placing danger signals on all power switches that have to be disconnected, fencing all entrances to the affected areas, marking these fences with approved danger signals, notifying the mine foreman and assistant foreman verbally of the dangerous condition and the action taken and reporting it in ink in the firebosses' record book. (4 percent)

First Class Foremen, Washington State *

Ventilation of Mines

Q.—What are the main considerations in a good ventilating system of a mine? What conditions would you try to avoid?

A.—In planning: (1) provide 100 cu.ft. of air for every person in the mine and 500 cu.ft. for every horse or mule, and as much more as may be necessary to keep the mine free from dangerous and explosive gases (Sec. 27). (2) Avoid continuous ventilation except for the coupling up of a short entry with a few men working in it with another entry not needing much ventilation. (3) Don't have the haulage in the return air current.

(4) Avoid, if possible, having to circulate the air back almost to the point from which it enters the mine. Take it through the mine and, if you can, pull or push it out at the far end, especially when the mine pitches up steeply from the entrance. (5) If possible, avoid taking return air downhill, for the methane in it may refuse to go along if the air is at all sluggish. When the air is taken to the deepest part of the section it has to ventilate and then is allowed to rise from that point to the surface, this is termed ascensional ventilation. If the mine rises steeply, you will have to take the fresh air uphill and then bring it back again downhill unless you have an opening to the rise of the mine, but, in a main return, the methane will sweep along well because the volume of air will be so great.

(6) Avoid as far as possible leaving air to travel at its own sweet will. You will need it where it will not want to go, so direct it carefully by brattices and curtains. (7) Use crosscuts usually known as "bleeders" to pass air from the partly caved areas in rooms to the return airways of another entry or level (see illustration). (8) Have fans suited to the mine they have to ventilate. (9) If fans are to operate underground, there should be a standby fan at the surface. The underground fan must be driven by electricity or compressed air (Sec. 27). (10) In the State of Washington, no furnace may be used for ventilation (Sec. 38).

In operation: (1) keep headings free of broken rock, standing water, uplifted bottom and, in the cross-section planned for air travel, from gobbed rock also. (2) Keep all overcasts and undercasts tight. If of wood they should be covered with fireproof material on all exposed sides or they should be driven through

solid strata (Sec. 39). (3) Keep ventilation doors closed except for passage of trips.

(4) Have double doors in main haulageways, so that one door will be closed when the other is open (Sec. 41). (5) Have extra open doors ready to replace doors which may be injured (Sec. 41). (6) Arrange to have doors close by gravity (Sec. 40) and to be kept closed by the pressure of the air current. (7) Prevent air from entering the return through crop falls.

(8) Self-acting doors of approved type should be provided or an attendant be stationed at all doors to open or close them when employees and cars have to pass them on their way in or out of the workings, though one attendant may attend two doors if his absence from one door will not endanger the safety of the employees (Sec. 42).

(9) All new permanent stoppings and renewals of old ones in crosscuts or break-throughs between the main intake and return airways must be substantially built of masonry, concrete or blocks of timber. Where timber is used it must be faced with concrete or other incombustible

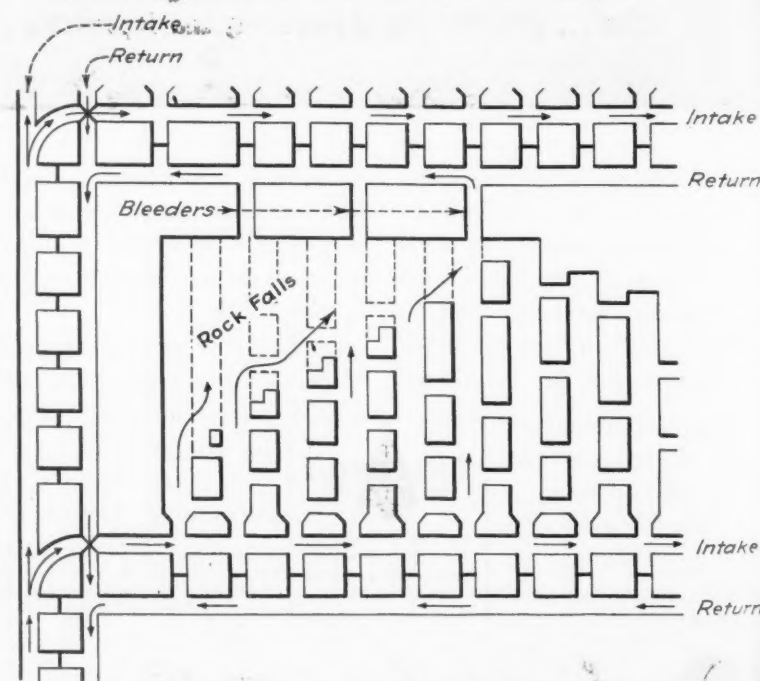
material (Sec. 43). (10) Stoppings on levels between intakes and returns must be substantially built and as near airtight as possible, and where the levels are 2,000 ft. or more long they must be built of masonry, concrete or blocks of timber (Sec. 44).

(11) Crosscuts between breasts, chutes or rooms, except the last, must be provided with stoppings, which may be of wood, however (Sec. 45). (12) Fans at nongassy mines should be stopped only during a suspension of work, temporary or otherwise, and started two hours before employees are admitted to the mine (Sec. 35). (13) Fans at gassy mines must be kept in operation continuously day and night unless operations are suspended for a week or more. However, the fan can be stopped at any mine for repair (Sec. 36).

(14) Every main ventilating fan must have a recording instrument to register the ventilating pressure of the fan (Sec. 37). (15) Have no more than 70 men in any one district or split unless in the judgment of the inspector this is impracticable, in which case there shall be no more than 90. (16) Return air from each district or split when 70 to 90 men are employed must be conducted direct or through an overcast or undercast to the main return airway (Sec. 28).

Q.—What are the two natural laws regarding pressure and power which govern the flow of air through a mine?

A.—The velocity and quantity of air passing through a given passage will be proportional to the square root of the pressure and to the cube root of the power, or, in other words, the pressure will be as the square of the velocity or quantity and the power as the cube of the velocity or quantity.

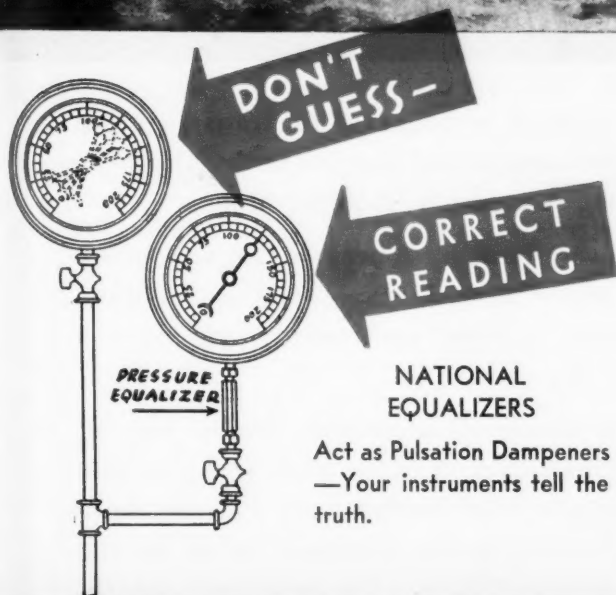


Showing how bleeders may be driven to pull air from the intake of one entry through the rooms to the return of another entry, thus ventilating rock falls. Width of headings and crosscuts made unduly large to permit of use of arrows to illustrate ventilation

* Condensed from July, 1943, *Coal Age*, p. 76.

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PROTECTS YOUR GAUGES AND RECORDING INSTRUMENTS FROM HAMMER AND DAMAGE CAUSED BY SURGING, PULSATING PRESSURES

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200 NEW *all-steel Mine Cars* ON TIMKEN BEARINGS



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To mine
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TIMKEN
TRADE MARK REG. U. S. PAT. OFF.
RAILWAY ROLLER BEARINGS

They are part of a program of transportation modernization inaugurated last year at the Allegheny River Mining Company's Cadogan Mine.

These cars were built by American Car & Foundry Company, Huntington, W. Va. They are of drop-bottom design, all-steel construction and have a capacity of $4\frac{1}{2}$ tons.

Just as today thousands of veteran Timken Bearing Equipped mine cars with many years of dependable and economical service behind them still are carrying on for Victory, so the Allegheny River Mining Company's new cars have a life expectancy stretching into the far distant future.

Is your haulage system equal to today's task? The Timken Roller Bearing Company, Canton, Ohio.

Free Enterprise

WE MUST ACT TO PRESERVE IT!



LIKE a leaf floating downstream, we are being carried along toward a new and uncharted economy. What this new economy will be like will depend, to no small extent, upon what industry does or fails to do during the coming months. Time is short; in fact, we may suddenly find ourselves standing on the threshold of a peace economy with our war boots still on our feet.

While bending every effort to win the war, we cannot afford to be caught unprepared for the peace. As Prime Minister Churchill said at Harvard, we are "bound, so far as life and strength allow and without prejudice to our dominating military task, to look ahead to those days which will surely come, when we shall have finally beaten down Satan under our feet and find ourselves with other great Allies at once the masters and the servants of the future." Unless we do look ahead, there is danger that we may become neither the masters nor the servants, but merely the victims, of the future.

The war has quickened our ailing economy and opened our eyes again to the possibilities of peace-time plenty. But it has also brought great dislocations of labor and capital; it has led to abnormal patterns in prices and income distribution; and it has created inflationary pressures with enormous potential powers to injure or to help us in the transition from war to peace.

The pattern of life in postwar America will be just what we make it. All of us will have a hand in shaping that pattern, but business men will have a special responsibility in the reconstruction. As employers of labor and capital and as enterprisers assuming the risks of new ventures, they will have to plan and carry out the conversion from war work to full peace-time production. Because of their key role, business men have a special opportunity to discover, and to help others to understand, the conditions which are necessary if they are to do their job satisfactorily.

This is a narrow view of postwar problems but it is a central view, because no one condition is more vital to the health of the world than a high level of production and employment in the United States. We cannot hope to lead the world out of economic chaos if we fail to put our own house in order. If we fail to adjust our domestic economy, we may destroy Adolf Hitler; but we will not destroy the germ that breeds "Hitlers." If we do not maintain the production necessary for supporting a large volume of imports and exports, then the plans for international monetary stabilization, for good relations with our neighbors, for rehabilitation of stricken countries, and for strengthening the democratic bulwarks against dictatorship are all likely to come to grief. We must demonstrate our capacity for world leadership, or be content to follow the leadership of others.

The prospects for achieving a sound and vigorous economy in the United States are not so good as to warrant complacency on the part of men genuinely interested in free enterprise and the political freedoms incident to it. We have yet to find means to utilize our vast and abundant resources for the good of all. We have yet to learn how to keep men from the terrible experience of unemployment and the fear of want which makes them willing to sacrifice freedom and opportunity for almost any promise of security. We have yet to reconcile the conflicting interests of labor, agriculture, and business so that they can work together effectively. We have yet to learn how to check the fever of inflation and cure the palsy of depression.

When we were attacked at Pearl Harbor, we realized our physical peril immediately and united in a tremendous common effort against the enemy. The onset of economic perils is less obvious. No bombs will signal the deterioration of the private enterprise system, the extension of regimentation, the further control of busi-

ness by government, and the concentration of political power in less and less responsible hands. If these things should befall us, they will come insidiously while we are preoccupied with self interests and oriented by popular misconceptions. If the freedoms of the individual shrivel as the state grows in power, it will be because the individual is too indifferent or complacent to concern himself seriously with economic problems. If our people are misled by false prophets and demagogues, it will be because business men did not understand economics, because scholars were too ignorant of practical affairs, and because we failed to produce economic statesmen of sufficient stature for the task in hand.

Thinking is hard work. Thinking about things outside our personal experience, about economic processes that are broader and in some fundamental respects different from buying and selling or running a business — is strenuous mental labor. Thinking straight about problems that are beyond our personal and immediate status and our pocketbooks, thinking about problems that involve nation-wide production, nation-wide employment and nation-wide buying power — in other words the operation of our entire economic system — involves real self-discipline. Yet there is no other way to safeguard our freedoms. We cannot rely on trial and error; tinkering takes too long; social experiments which turn out wrong can be undone only at great cost — if at all. If we proceed blindly, we shall flounder into an economic and political morass from which we cannot escape.

We floundered badly all through the Thirties, until the war lifted us temporarily to higher ground. When the war boom is over, we shall be back floundering worse than ever unless we find a solid road along which to proceed.

America has grown rich and strong under a system of political and economic freedom. Opportunity and the necessity of self-reliance have brought forth great accomplishments. The hope of profit and the spur of competition have urged men on to find new and better products, new and better methods, and to risk their savings in pioneer investment. Never has a country achieved so high a standard of living and afforded so large an opportunity for the individual man and woman. It is not surprising that some distinguished business leaders, looking back over their own experience, tell us that everything will be all right if only there is "less government in business."

I wish the solution were as simple as that. However this is only part of the answer. It is becoming in-

creasingly clear that industrial capitalism as we know it contains within itself certain fundamental weaknesses which can lead to its destruction if they are not counteracted. No democracy can survive when twenty to thirty per cent of its workers cannot get jobs. That happened here in the Thirties. For years on end, despite fumbling efforts at recovery one out of every five workers was denied a chance to earn a living in private business. We shall never again have such mass unemployment as occurred in the bottom of the Depression, because the government will take it upon itself to create jobs if business cannot offer them. Whenever that happens, however, the area of private enterprise will be reduced and that of government will be expanded — and the concentration of political power will be increased. This is the challenge we business men face today, and ours is the first opportunity at finding the solution.

The crux of our economic problem is unemployment. Unless there are jobs for ninety to ninety-five per cent of those who are able and willing to work, there will be widespread fear and lack of opportunity, which will drive labor unions, agricultural groups, and business interests to take self-protective measures. Such measures are certain to restrict production, stifle progress, and imperil our democratic way of life. Not all our problems will automatically be solved if we learn how to avoid mass unemployment, but they will at least then have a good chance of solution.

And so American businessmen face a great responsibility! We will have to find the answer to a great many momentous questions. We will have to delve into problems that cannot be solved by precedent.

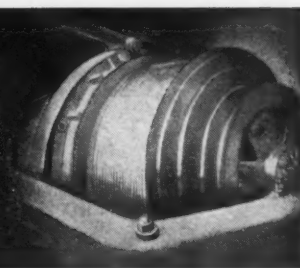
Looking backward to these times, future historians are likely to say that here we Americans stood at the crossroads and, consciously or not, made our choice between a system of private enterprise and personal freedom and a system of collectivism and regimentation.

It is particularly appropriate, therefore, as the problems of our time take shape and as events rearrange their order and importance, to appraise the steps we are taking and point the way we are going. It is my plan to present such analyses from time to time to the one-and-a-half million readers of McGraw-Hill publications.



President, McGraw-Hill Publishing Company, Inc.

TIPS FROM MANUFACTURERS



Handy Calculator Saves Time In Routine Work

The kva.-kw.-hp. calculator, a gadget for plant engineers and electricians, is offered by V. W. Palen, Westinghouse Electric & Mfg. Co., East Pittsburg, Pa., to save time in making routine calculations involving electrical capacities. It solves single- and three-phase problems expressed by the following formulas:

(a) Single-phase

$$Kva. = \frac{\text{Volts} \times \text{Amp.}}{1000}$$

$$Kw. = \frac{\text{Volts} \times \text{Amp.} \times P.F.}{1000}$$

$$Hp. = \frac{\text{Volts} \times \text{Amp.} \times P.F.}{746}$$

(b) Three-phase

$$Kva. = \frac{\sqrt{3} \text{ Volts} \times \text{Amp.}}{1000}$$

$$Kw. = \frac{\sqrt{3} \text{ Volts} \times \text{Amp.} \times P.F.}{1000}$$

$$Hp. = \frac{\sqrt{3} \text{ Volts} \times \text{Amp.} \times P.F.}{746}$$

"The range of the calculator, 5 to 200 (kva., kw. or hp., as the case may be), can be extended easily to cover a range of 50 to 2,000 merely by multiplying all values by 10. It can be used to find kva., kw. or hp. from known values of amperes and volts; similarly it will determine am-

peres for given values of voltage, kva., kw. and hp. Thus, knowing the size motor to be installed, an electrician can quickly determine amperes—from this he knows what size wire to use for the circuit. Conversely, having read amperes at transformer terminals—the calculator tells what load, in kva., the transformer is carrying.

"To assemble, cut out both disks (also small windows) and mount on cardboard with rubber cement. Punch the center holes carefully—then insert a small brass bolt in the holes. Washers, if used, will save wear and tear on the paper. The bolt should be tightened to give the proper pressure on the disk—they must hold their setting, yet turn easily. A drop of solder applied to the nut will make the assembly permanent."

Squirrel-Cage Motor

Fairbanks-Morse & Co., Chicago, offers a new type all-purpose continuous-duty polyphase squirrel-cage induction motor for use in all kinds of industry. According to the company, it is "protectioneered" and embodies many special and vital features.

Constructed with the centrifugally cast F-M copperspun rotor, this new motor is said to be fully protected against flying chips, falling particles, dripping liquids, and other industrial motor hazards.

The new motor also incorporates an

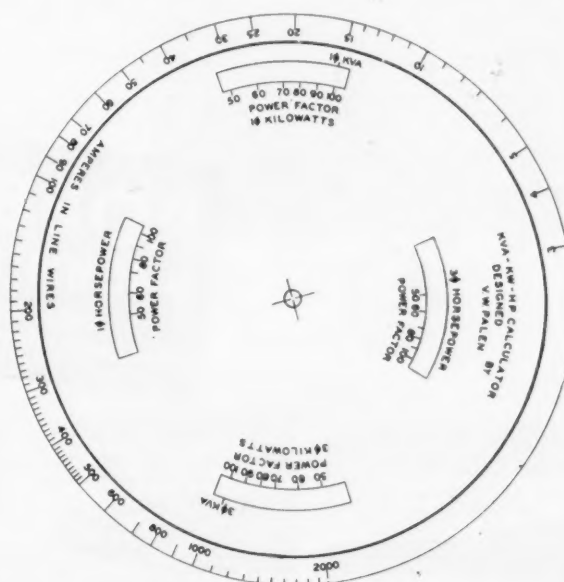
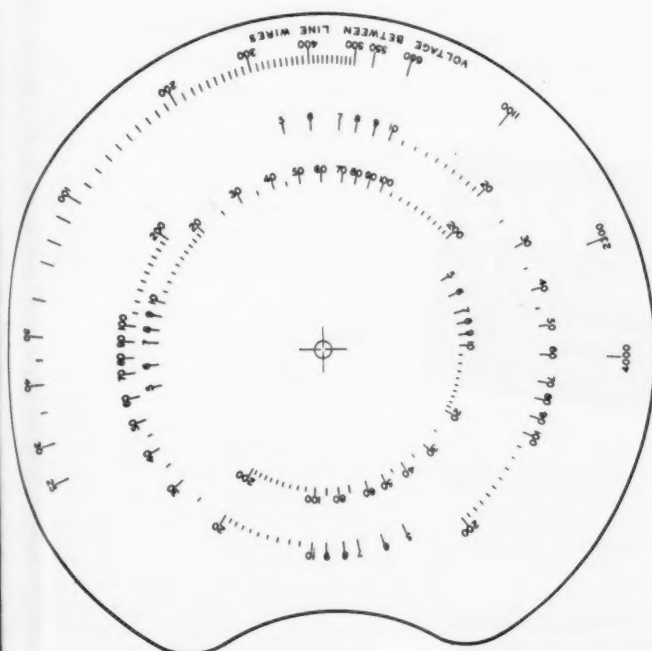


innovation in conduit boxes. Where space is limited, the conduit can be brought up between the motor feet to the tapped hole in the motor frame and the conduit box cover assembled flush with the frame. The external box is then discarded. When the conventional conduit box is used it can be mounted in any one of four positions.

It is rated 40 deg. C. and designed to carry 15 percent load continuously without injurious heating (1.15 percent service factor).

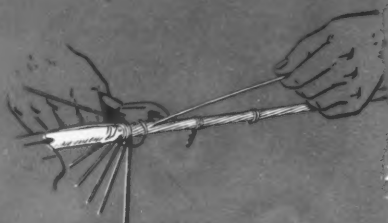
Lubricating Oil

Development of a new detergent-type lubricating oil designed to reduce wear and assure engine cleanness and oil stability for low-speed diesel engines is announced by the Standard Oil Co. of In-



"The Right Splice"

MEANS LONGER LIFE



EACH CONDUCTOR'S center bunch of wire strands are clipped short—battered together—braided. Successive layers of wire bunches are clipped to butt in staggered arrangement—braided.



COMPLETED CONDUCTOR SPLICE—with diameter approximately identical to that of original conductor. Sturdy interwoven effect is similar to that of expertly spliced rope—but minus appreciable diameter increase.



LOWER CABLE—"Properly spliced." Top one—regular electric cable splice. Note unchanged diameter of spliced area on properly spliced cable. Here, completed conductor splice has been vulcanized. Cable is ready for use.

Avoid discarding usable cable by making the right splices right in your mine

WITH A LITTLE PRACTICE, your electric cable maintenance and repair men can splice damaged or short cable lengths this way, extending their useful life and keeping equipment in service. The result will be sturdy, flexible splices, ready to stand the tough service portable cables are bound to receive.

As a part of your regular cable inspection and repair program, make it a point to have your maintenance men schooled in the proper methods of splicing conductors and insulating the joints. Give maximum life to the cables you now use, because the former standard of portable mine cables are difficult to replace today.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

ROEBLING

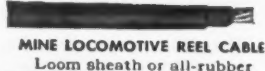
MINE WIRES AND CABLES
are designed for long life
even under adverse conditions of service



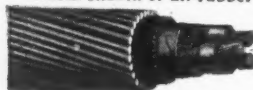
MINE ENTRY CABLE
Non-metallic—Rubber



MINING MACHINE CABLE
Loom sheath or all-rubber



MINE LOCOMOTIVE REEL CABLE
Loom sheath or all-rubber



BORE HOLE CABLE
Rubber or Varnished Cambric
Round Wire Armor



TROLLEY WIRE
Round, Grooved Fig. 8,
Fig. 9 (Deep Section Grooved)



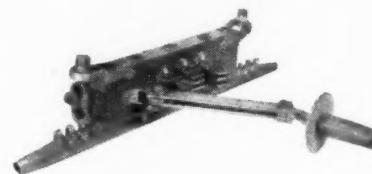
ARMATURE AND FIELD COIL—
For Motor Repair

diana, Chicago. Many engines give clean operation with conventional oils, but where dirty operation cannot be corrected by mechanical adjustment, the new detergent-type lubricating oil can be used, according to S. O. engineers. The new oil, it is said, will thus prevent ring sticking, piston scuffing and excessive sludge and gum deposits.

The detergency results from the use of an additive which is both a detergent and an oxidation inhibitor. With the new detergent-type lubricating oil for low speed diesels, say S.O. engineers, a film coats the carbon and dirt, prevents particles from sticking and holds them in suspension until they are trapped by a filter or drained from the engine.

Trolley Feeder Switch

Mosebach Electric & Supply Co., Pittsburgh, Pa., has perfected a combination trolley single or double feeder switch of the reversible type. It employs two $\frac{1}{4}$ - and $\frac{1}{2}$ -in. busbar copper blades hinged on the insulated wood block of the switch, and



is equipped with a single or double feeder-clamp connection which is easily installed and removed.

This new trolley feeder switch has double, insulated suspensions and a knife-edge approach to insure smooth underrun. For safe manipulation and application, the switch incorporates a soft rubber handle with a fiber guard, and the blades have dowel holes for lockage in the open position.

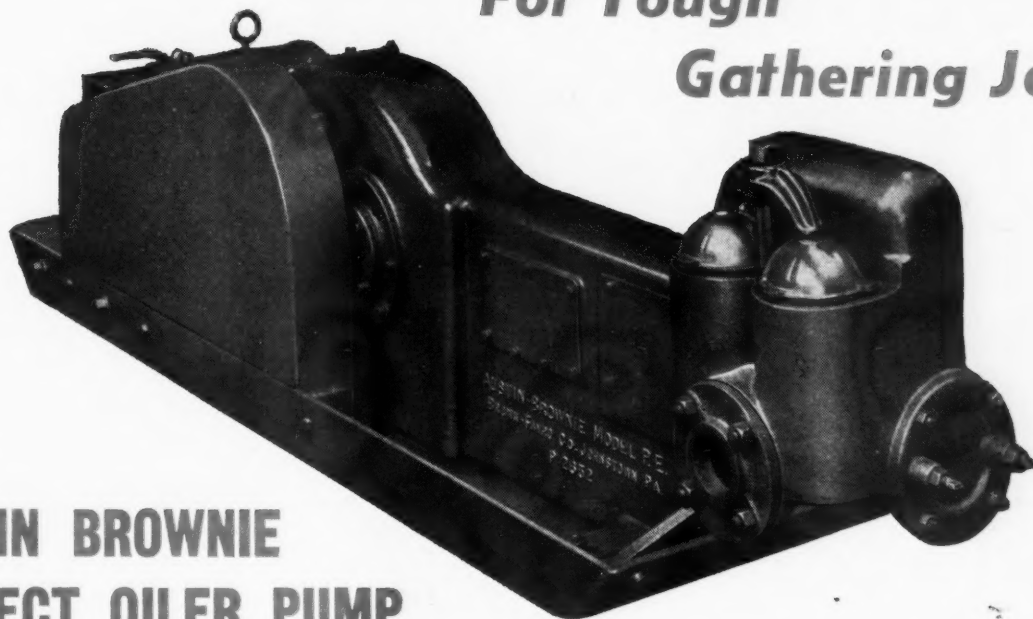
Safety Poster Service

Vachel Davis' Minartis Studio, Eldorado, Ill., offers coal mining companies an individual accident-prevention service that will feature their own specific problems both in picture and in text matter. This service, featuring "made-by-a-miner" safety posters, is designed to supply a vital need in the conservation of manpower at this time to the coal-mining industry.

Pipe Gage

Three-Point Gage Co., Chicago, announces a new pocket-size three-point pipe gage for instantaneous measurement of all sizes of pipe from $\frac{1}{8}$ to 12 in. This gage consists of two pivoted steel plates with edges curved at three points for contact with the pipe to be measured, together with a point scale which, it is said, automatically registers not only the pipe size in terms of inside diameter but also the drill size for tapping. Constructed of steel with deeply etched numerals, the gage when closed is $2\frac{1}{2} \times 4\frac{1}{4}$ in.

For Tough Gathering Jobs—



THE AUSTIN BROWNIE PERFECT OILER PUMP

High heads, acid water, silt, long suction lines, pumping water from several sumps, handling air and water alternately—these are conditions under which Austin pumps have been working successfully for over twenty years.

Austin-Brownie Perfect Oiler Pumps are now made in four sizes, rated from 30 to 100 G.P.M., and for heads up to 250 ft. Water cylinders are of cast iron, high-lead bronze, or chrome iron.

The 4x5 pump illustrated is mounted on a sled-type base, with V Belt drive between motor and countershaft. The power frame is fully enclosed and all working parts are oil-bath lubricated. Overall dimensions: Length, 6'-7"; width, 20"; height, 24".

For conditions that lick ordinary pumps—specify Austin-Brownie.



Turtle Back Strainer for use on suction lines of all gathering pumps. Made in 2" and 3" sizes, of cast iron, bronze, or chrome iron.

Other BROWN-FAYRO Specialties

BLOWERS	MINE CARS	CAR SPOTTERS	RERAILERS
RETARDERS and WHEELS	HOISTS	SHEAVES	

THE BROWN-FAYRO COMPANY

JOHNSTOWN, PENNA.

Why SCHRAMM COMPRESSORS are Water Cooled!



The basic system of any cooling system is simply to remove heat of piston travel and reciprocating parts from the surrounding metal as quickly as possible by the cooling medium. Heat travels from metal to water 200 times faster than from metal to air. By using water to carry heat away and by providing water jackets which completely surround compressor cylinders and heads, SCHRAMM achieves the following outstanding advantages:

- ...assured uniformity in cooling.
- ...elimination of unequal expansion and contraction which might cause distortion.
- ...absolute control of operating temperatures to the desired degree.
- ...longer life to compressor parts.
- ...higher efficiency of compressive cycle.
- ...higher compressor capacity at lower power cost.
- ...greater capacity in smaller overall space requirements.
- ...ability to provide compressed air efficiently under any and all temperature conditions.
- ...ability to provide compressed "air where it's needed," regardless of the amount of water available for cooling. SCHRAMM compressors are built in types equipped for re-cooling water (as well as for running water).

Get all the facts . . . NOW!

Write at once for complete details. Send for Catalog No. 42-5.

SCHRAMM, INC., WEST CHESTER, PA.
THE COMPRESSOR PEOPLE

SCHRAMM Air Compressors

Trade Literature

ANTI-FRICTION BEARINGS—Ahlberg Bearing Co., Chicago. Booklet tells why bearings are used, the function of each type of bearing, how loads are transmitted and all the whys and wherefores of bearing designs and uses.

BELT CONVEYORS—Continental Gin Co. (Industrial Division), Birmingham, Ala. Engineering Data Book 1D-105 pictures belt conveyor installations by Continental besides presenting descriptions and engineering data on belt idlers, idler rolls and rubber belts, automatic gravity take-ups (horizontal and vertical), trippers, etc.

DRAFT CONTROL—Preferred Utilities Mfg. Corp., New York City. Bulletin shows how, by installation of a simplified, automatic draft-control device, it is said to be possible to effect savings of 10 to 30 percent in the fuel consumption of natural-draft boilers. The device described is the Draft-A-Justor.

DEGREASERS—Colonial Alloys Co., Philadelphia, Pa.—Bulletin Form 11543-1 Sup. describes the uses of the four available types of Cyclo-diene-base hydrocarbon solvent degreasers and cleaners for metals.

FIRE PROTECTION—Albi Firepel Corp., New York City. Bulletin describes Albi-Firepel "S," a fire retardant that may be applied by brush or power spray gun.

JACKS—Duff-Norton Mfg. Co., Pittsburgh, Pa. Bulletin DN437, fully illustrated, contains condensed descriptions of the various applications of Duff-Norton jacks in industrial plants, mining, railroads and transportation, construction, aviation and shipbuilding.

MAGNETIC PULLEY MAINTENANCE—Dings Magnetic Separator Co., Milwaukee 7, Wis. Handbook on the operation and maintenance of magnetic pulleys features information on trouble shooting, trouble prevention, repairs, recommended operating practices and general maintenance.

OIL PURIFIERS—Youngstown-Miller Co., Sandusky, Ohio. Bulletin YM-600 describes A and GH lines of lubricating and hydraulic oil reclaimers with capacities ranging from 2½ to 120 gal. in 70 to 90 minutes. The reclaimers are recommended for restoring all types of used oils.

PUMPS—Joshua Hendy Iron Works, Pomona Pump Co. Division, Pomona, Calif. Catalog 43 gives the complete story about each of the Westco pumps, with a brief description of Pomona pumps.

SAFETY GOGGLES—American Optical Co., Southbridge, Mass. A new sound motion picture titled "Right on the Nose" shows in detail the quickest, easiest methods of adjusting non-prescription industrial safety goggles so that workers can wear them in comfort. A booklet with the same title is profusely illustrated with scenes from the film and the copy explains the proper methods of adjusting goggles. No charge is made for loan of the film.

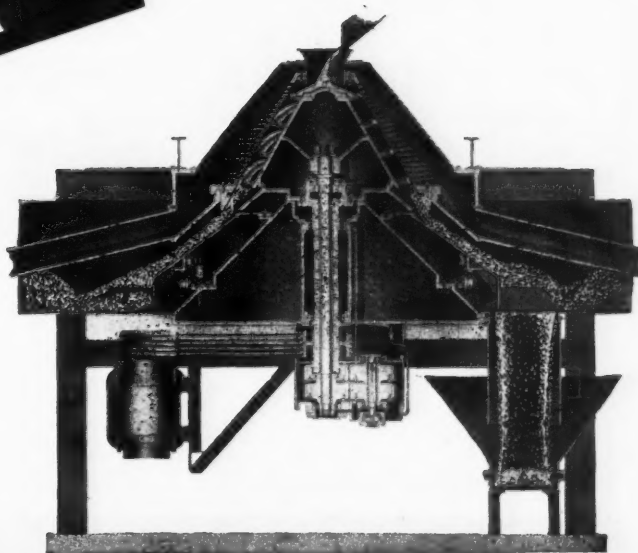
AN *Economical* SOLUTION FOR THE RECOVERY AND HANDLING OF THE FINER COAL SIZES

The coal delivered by this Centrifugal Dryer is in a condition where it does not clog cars, spouts, etc., and does not freeze in transit or storage.

Sludge and slurry coals may be reclaimed and made salable, for with those slurries carrying a large amount of clay, the clay may be washed out and discarded with the dryer effluent.

Or where the sludge consists of good carbon, by use of a closed system practically all of it may be dried and saved.

"C-M-I"
Continuous Centrifugal
DRYER



CENTRIFUGAL AND MECHANICAL INDUSTRIES, INC.

SECOND AND PRESIDENT STREETS

ST. LOUIS, MO.

*Will your coal meet
tomorrow's
competition*

**PROPERLY
BLENDED
COAL**

**WILL BE ONE
INDUSTRIAL MUST**

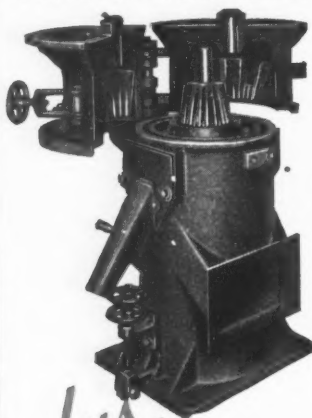
Take for instance the proper sampling and blending of coal from different sections of the same mine. Upon the result of correct LABORATORY CONTROL depends whether the blending will meet the specific needs of modern users who insist on certain COAL QUALITIES. The new scientific products—synthetic rubber, plastics, chemicals, metallurgicals, gas—demand increased laboratory control in coal preparation—and many modern mine operators are finding that such control is speedy, simple and economical with

STURTEVANT

**LABORATORY
EQUIPMENT**

Insures perfect results

Here are two units:



**THE STURTEVANT AUTOMATIC
COAL CRUSHER and SAMPLER**

Your coal operators need no sales talk on today's vital importance of PROPERLY SAMPLED COAL to produce a properly blended and graded QUALITY product. Even with the manpower shortage you can get such samples—and save time, too. With the Improved Sturtevant Automatic equipment you can crush and sample 1000 lbs. in a FEW MINUTES, saving 32 operations, eliminating all inaccuracy due to the human element, and getting a far superior product for shipment to the Laboratory.

Interested? Then write for Bulletin 85—"How to Sample Coal Automatically".

plus

THE STURTEVANT FINE GRINDER

The Sample Grinder is of the "open door" disc design, producing products as fine as 100 mesh (coarser, if desired) working on dry, friable, soft or moderately hard materials. Handwheel regulates output from 10 to 100 mesh. Will handle hard rock and ore at reduced capacities. Specifications and prices on request . . . Bulletin 067.



For laboratory control

write

for Bulletins giving complete description of Sturtevant Laboratory Equipment. We suggest that you let us work with you to develop your post-war markets for quality specification coal, through more scientific preparation, which will help you attain and retain INCREASED COAL SALES.

STURTEVANT MILL CO.

**14 HARRISON SQ.,
BOSTON, MASS.**

Industrial Notes

CUTLER-HAMMER, INC., Milwaukee, Wis., manufacturer of motor control apparatus, has appointed P. S. Jones as general sales manager. He first became associated with the company at Milwaukee as a sales engineer in 1915.

METAL & THERMIT CORP., New York City, has appointed William C. Cuntz as district manager, welding division, with headquarters at the corporation's Pittsburgh office. His territory will include southern New Jersey, Pennsylvania, Ohio, Kentucky, Tennessee and Alabama. Louis G. Vock and James M. Wilson have been appointed district engineers. Mr. Vock will operate from the Chicago branch and Mr. Wilson from the Pittsburgh branch.

E. I. duPONT DE NEMOURS & Co., Inc., Wilmington, Del., has named Charles B. McCoy as director of sales of the explosives division. He succeeds Samuel G. Baker, who has been made manager of the electro-plating division.

JOHNS-MANVILLE, New York City, has appointed E. A. Phoenix as assistant manager of its Transite asbestos pipe department. His business career began with the Kieselguhr Co. of America in 1915. This firm later became the Celite Products Co., which became part of Johns-Manville Corp. in 1928.

MACWHYTE WIRE ROPE CO., Kenosha, Wis., received in Aug. 25 its second Army-Navy "E" award for "continued and determined effort and patriotism."

JOHNSON-MARCH CORP., New York City, manufacturer of coal-dust-allaying compounds, has appointed Urquhart Service, Denver, Colo., as its representative in the States of Colorado, Wyoming, New Mexico, Arizona and Montana.

MACK TRUCKS, INC., New York City, has appointed A. N. Morton as vice president and director of Mack Mfg. Corp. and C. W. Haseltine as vice president of Mack Trucks, Inc. Mr. Morton retains his position as production manager of Mack's factory holding in Plainfield and New Brunswick, N. J., and Allentown, Pa. Mr. Haseltine will continue his secretary-treasurer duties.

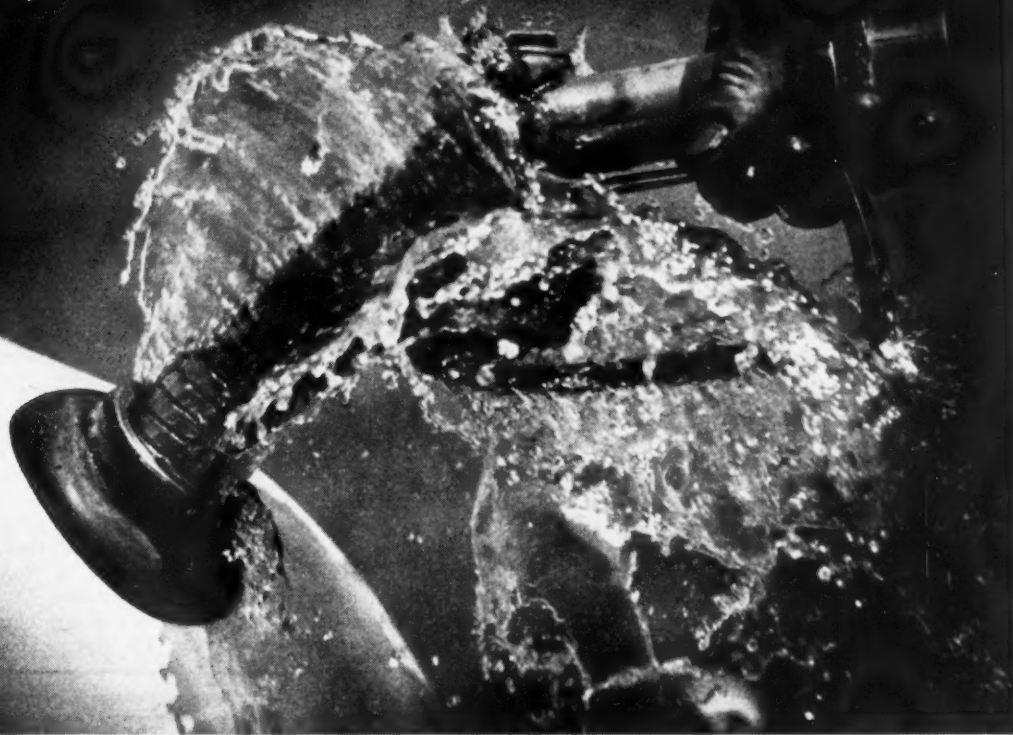
WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa., has elected Gwilym A. Price as a vice-president, his responsibilities to include settlement of war contracts. He formerly was president of the Peoples-Pittsburgh Trust Co. Thomas I. Phillips, vice-president, has been made head of the company's Pittsburgh divisions, succeeding A. C. Streamer, who has been named assistant to the president, with headquarters in Pittsburgh.

JENKINS BROS., Bridgeport, Conn., manufacturer of valves, raised the Army-Navy "E" emblem with an added second star at its plant on Aug. 28. An additional gold star for its U. S. Maritime Commission "M" pennant also has been awarded.

C. O. BARTLETT & SNOW CO., Cleveland, Ohio, has appointed Martell & Ferree as sales representative in the Philadelphia area comprising eastern Pennsylvania, southern New Jersey and Delaware.

KENNAMETAL, INC., Latrobe, Pa., opened an office and warehouse at 3701 North Broad St., Philadelphia, Pa., Oct. 1

STOP wasting motor fuel!



RING-FREE Motor Oil saves fuel 2 ways

RING-FREE REMOVES CARBON. Carbon on pistons, rings, valves decreases motor efficiency—leads to loss of power—wastes fuel. Macmillan RING-FREE Motor Oil *removes carbon* while the motor runs! That means better motor lubrication and substantial fuel savings.

RING-FREE REDUCES FRICTION. The 2nd thing RING-FREE does to save fuel is reduce motor friction fast! That releases more power to the drive shaft and really cuts fuel waste. Here's proof: In 1094 certified road tests, with various makes of owner driven cars, the

average saving of *gasoline* was 1.3 miles per gallon after crankcases had been drained and refilled with RING-FREE Motor Oil. In many types of *Diesel* operations, as much as 25% reductions in operating costs (including fuel and maintenance) are reported. At the same time, oil consumption is reported decreased. Remember saving fuel is important—but beyond that, when it's better motor lubrication that saves fuel it also means a reduction of motor wear.

**MACMILLAN
RING-FREE
MOTOR OIL**

MACMILLAN PETROLEUM CORP.
50 W. 50th, New York; 624 S. Michigan Av., Chicago; 530 W. 6th, Los Angeles
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REDUCES WEAR BY REDUCING FRICTION

for the direct sale, tool engineering and services in the distribution of the company's process products in the area comprising eastern Pennsylvania, southern New Jersey, Maryland, the District of Columbia, Virginia and certain other specific areas. William S. Jones is in charge.

JOHN DELANEY, for many years maintenance foreman for the Pittston Coal Co., Pittston, Pa., and until recently employed by Lodge & Shipley, lathe manufacturer, Cincinnati, Ohio, has accepted a position in charge of the shops of the Medico Electric Motor Co., Pittston, Pa.

UNITED STATES RUBBER CO., New York City, is observing 100 years of continuous experience in the production of vulcanized rubber goods, according to the September issue of *Us* magazine, the company's employee publication. The Nauga-

tuck (Conn.) plant was the first to start commercial production under the original vulcanization patents and the first product was an overshoe. The company's long experience with rubber is being converted to replacing rubber with synthetic.

Morris Company Head, Stuart Saks, Dies

Stuart J. Saks, 52, president of the Morris Machine Works, Baldwinsville, N. Y., died Sept. 4 in University Hospital in that city. Mr. Saks was in newspaper work for a time before turning to manufacturing and had executive positions with several companies before joining the Baldwinsville company about three years ago. He was made president of the Morris company two years ago, directing it in increasing activities as it became busy with war work.

Getting Extra Service From Bearings Under Wartime Conditions

POINTING OUT that the use of reground and reconditioned ball bearings is no innovation, the Ahlberg Bearing Co., Chicago, which "introduced and perfected this process over 34 years ago," states that such a bearing "can be depended on to give the same kind of reliable service" that it gave when new.

"Wider use of reground bearings has several definite advantages in the present emergency," says Ahlberg. "It permits a substantial saving in the vitally needed alloy steel used for making the inner and outer races of ball bearings. And since a reground bearing requires considerably less labor than a new bearing, more bearings can be produced with the same number of man-hours. Skilled labor, able to do precision bearing work, is one of the worst bottlenecks facing the bearing industry. Moreover, the use of reground bearings will make an increased number of bearings available without requiring a proportionate increase in the number of machine tools required to do the job, since worn bearings can be reground with very much less machine-tool time than is required to make new bearings.

"What is necessary for success with reconditioned bearings is that the work be done by an organization properly equipped and thoroughly experienced in this work. When a worn bearing is properly reground, it can be depended on to give the same kind of reliable service that it gave when new. Fortunately, for the present emergency needs, established bearing regrinders are well organized to expand the process as rapidly as possible and many present-day bearing distributors are thoroughly familiar with reground bearings and have been supplying them for years to industrial users and railroads.

"What is a reground bearing? How is it done? What does it cost? These questions can best be answered by following the course of a typical bearing along the path it follows in going through one of the well-developed organizations set up for this business.

"When a ball bearing becomes unserviceable on account of normal wear, the user ordinarily delivers it to a local supply house or jobber of the factory that specializes in regrinding. The local wholesaler makes bulk shipments of worn bearings to the factory, where they go through a standard production line especially designed for this reprocessing.

"First, the worn bearings are washed and inspected so that all bearings not suitable for reconditioning can be discarded. The acceptable cleaned bearings are then taken apart and the old balls and ball retainers are immediately discarded. The inner and outer races of the bearings remain, still perfect except for the fact that the grooves or raceways in

which the balls roll have been worn deeper than they were when the bearing was new.

"Contrary to a common belief, the special alloy steel in the bearing is just as good as it was the day it was made (service-proved). Burned and cracked bearings are, of course, eliminated and careful inspection makes certain that only races showing normal wear are reprocessed.

"As a matter of fact, the steel in a good used bearing, like the steel in a good used engine, has been service-proved. Actual use has given it the most thorough test a piece of steel can have. All that is needed to make it suitable for further use is to correct the contour of the circular raceways in which the balls travel, where the surface has been worn away by use. Once this curvature has been corrected by regrinding, the raceway is as good as new.

"The process of regrinding and finishing follows exactly the same methods that are used in making new bearings. Experienced regrinders use the same type of machine that is used for the finish grind of a new bearing raceway. What is saved is all the preliminary work from the making of the special alloy steel to the final finish grind. The original heat-treating and the original grinding of all non-wearing surfaces is left just as it was the day the bearing first went into service. This, of course, represents only a fraction of the time, work and equipment needed to make a new raceway from the raw material. The actual saving represents between a half and a third of the cost of making a new ball bearing. But most important of all now is that the new alloy steel and the labor and equipment are needed in making new bearings for war equipment.

"The reground raceways are put through the same number of inspections as are



William Whaley, president and general manager, Myers-Whaley Co., Knoxville, Tenn. (left), receives U. S. Ordnance Department's 94th citation for distinguished service to his country. Major L. G. Gerow, representing Major General Levin H. Campbell, Jr., chief of ordnance, made the presentation in recognition of Mr. Whaley's redesign of artillery trainer parts, which was cited as "a marked contribution to the vital war production program."



Recovering the Fines Makes *Every* Ton Count

WHAT is a ton of fine coal worth to you, particularly if it has higher calorific value than lump coal as in most washeries?

A number of coal operators have already given the recovery of fine coal serious consideration, checked its value and installed the American Disc Type Filter for continuously recovering and dewatering the fines. Operating and maintenance costs are only a few cents per ton of dry coal filtered. All report the investment well worthwhile.

If you find that the fine coal going to waste in your washery has a good BTU value, why not raise the STOP sign now? Consult with us about installing an American Filter for continuously recovering them.

A large tonnage of coal fines is being dewatered daily on Oliver United Filters by such companies as: Weirton Steel Co., Woodward Coal and Iron Co., Crucible Steel Co., Republic Steel Corp., Jones & Laughlin Steel Corp., Buckeye Coal Co., Pittsburgh Coal Co., and Hanna Coal Company.

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Increase Production
With
WILLISON
Automatic Couplers



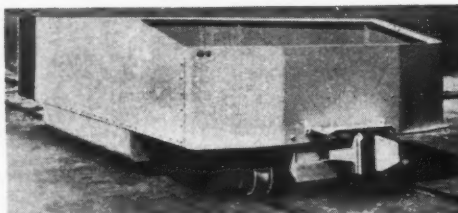
With simple spring draft gear
Speed haulage operations—Reduce accidents

WILLISON
Automatic Couplers
Pay Dividends

1. In Faster Operation
2. In Increased Tonnage
3. In Fewer Accidents
4. Protection to cars through ample cushioning and reduction of slack.

For Details get
Circular No. 5240

Write today

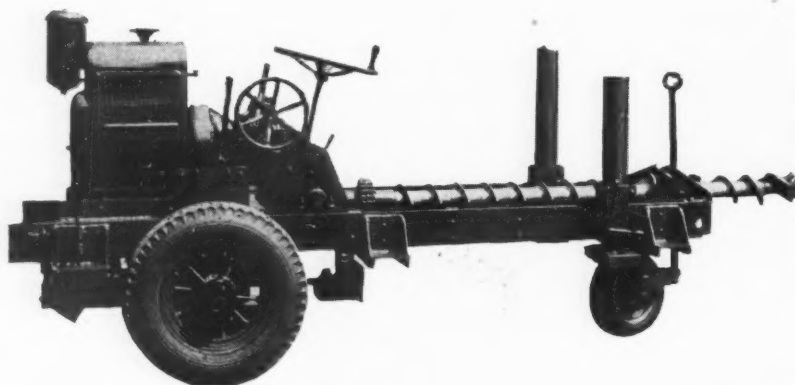


With National Friction Draft Gear

 **NATIONAL MALLEABLE & STEEL CASTINGS CO.**
CLEVELAND OHIO

PARMANCO Horizontal Drills
"Positive Control Drilling"

Parmanco Horizontal Drills give you "Positive Control Drilling." Parmanco Vertical and Horizontal Drills are today's leaders in low cost, low maintenance drilling—All Parmanco Drills are equipped with patented Parmanco augers. Used by leading strip mine operators—Write us your drilling problems.



PARIS MANUFACTURING CO.
PARIS, ILLINOIS

new bearings and then they are ready for reassembly. In reassembling, new oversized balls are used and new ball retainers are installed. The reason for this is that the bearing now requires balls which are a few thousandths of an inch larger than the balls used in the first place. The fact that the balls are larger than the original balls has one important advantage. The carrying capacity of the bearing has been increased, not decreased. The corrected curve in the raceway and the larger diameter in the new balls thus provide a slightly increased load bearing and wearing surface.

"Since the balls are new and slightly larger, most reputable regrinders take no chances by attempting to use the old ball retainers. Assembly methods as well as inspection and testing follow exactly the same methods used for new-bearing production.

"After this, the reground ball bearing is ready to return to service and is guaranteed to deliver exactly the same service that it gave on its original run. In practice, if the bearing is one of the standard sizes, the user seldom waits for the return of his original bearing. Most established bearing distributors who handle reground ball bearings maintain a supply of freshly reground bearings in stock in the standard sizes. This means that a bearing ready for service can be delivered to the user at the same time that he brings in his worn bearing. With special sizes and with unusual bearings which a dealer could not be expected to keep in stock, however, it may be necessary to wait for the bearing. Many users of special bearings, however, avoid this delay by carrying a small number of extras in stock themselves so that they always have bearings on hand ready for replacement when needed. . . .

"For months and months the new-bearing manufacturers have been producing new bearings at top speed. The present severe shortages for civilian uses are not due to any failure of the country's bearing-producing plants. As a matter of fact, most bearing plants are producing from two to four times more new bearings than they have ever manufactured before. The trouble arises from the fact that the number of bearings required to feed a modern war are far beyond the normal needs of the country or anything that was ever expected. There are few pieces of military equipment that do not demand ball bearings some place in their construction. . . .

"Such a situation makes it vitally necessary that every possible measure be taken by industry and maintenance men to conserve bearings, and see that every bearing is properly cleaned, washed and repacked at regular intervals so that it will give the maximum amount of service. Civilian needs must be reduced to the absolute minimum and reground bearings should be used for every replacement need.

"Bearing making is precision work of the highest type and the amount of skilled labor required cannot be increased overnight. Every alloy-steel bearing raceway that can be reground and put back in service releases just that much valuable steel and valuable time, labor and equipment from civilian needs so that it can be devoted to production for defense uses.



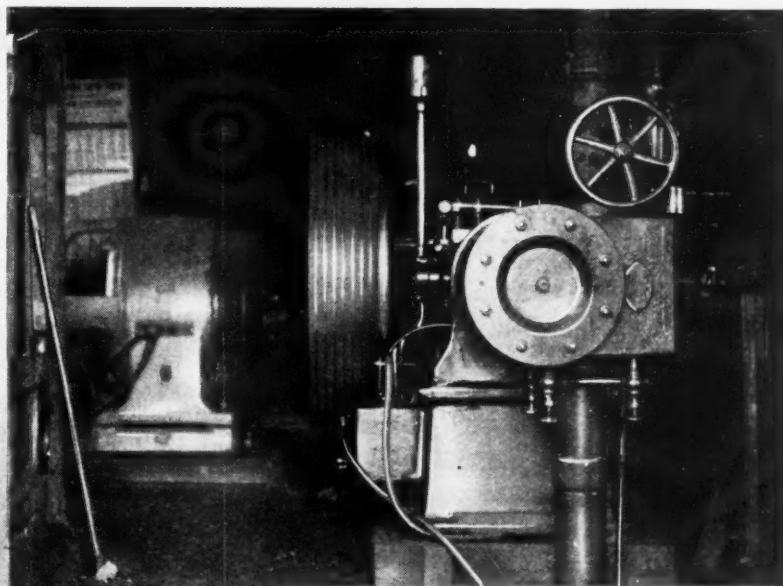
Official U. S. Navy Photograph

BATTLE ACTION

"over there" needs all-out *STEAM* plant support here. To maintain full designed engine output use . . .

...SINCLAIR STEAM CYLINDER and VALVE OILS. These oils are suited to high, low, or moderate pressures and temperatures and varying engine characteristics. They atomize quickly . . . give safe lubrication under all load conditions.

Write for "The Service Factor"—a free publication devoted to the solution of lubricating problems.



SKINNER 135 h.p. slide valve steam engine in Brownfield & Kokensparger mine, W. Lafayette, Ohio. Sinclair oils used with "very satisfactory results."

SINCLAIR INDUSTRIAL OILS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY (INC.), 630 FIFTH AVENUE, NEW YORK 20, N. Y.



"Wheat Mine Lamps are the only Mine Lamps 'powered' by Exide Ironclad Battery Plates made by The Electric Storage Battery Co., The World's Largest Manufacturers of Storage Batteries for every purpose."

- 8.** The Wheat lead-acid type Battery — lighter in weight but rugged in construction — produces a substantially higher voltage throughout the shift thereby guaranteeing a higher working light efficiency. Its light producing efficiency is maintained above 80% of maximum — and provides more light per pound weight.

WHEAT

The Engineered Cap Lamp

Check these Features!

- 1** Two bulbs (one for emergencies) — miner is never in the dark.
- 2** Center mounted, Krypton-filled bulb, gives 20% more light — no dark "shadow spot" in beam.
- 3** Choice of 3 reflectors gives narrow concentrated beam, a medium beam, or a widespread beam of light — suits all working conditions.
- 4** Headpiece weighs less than 6 ounces, Lamp Cord 6 ounces, Battery 62 ounces — Total weight of Lamp complete 74 ounces.
- 5** Headpiece molded of strong bakelite; sealed, moisture-proof and dust-proof.
- 6** Rubber battery case — non-conductor of electricity — a valuable safety feature.
- 7** Battery solution (free) limited to one ounce total both cells.
- 8** Lead-acid type battery maintains high voltage throughout shift (80+% efficiency) — year after year.
- 9** Battery charged through headpiece and cord of cap lamp — a daily test of all connections.
- 10** Designed for self-service charging system for lowest lamphouse operating cost.
- 11** To charge, headpiece is simply slipped on to key in charging rack, and turned to make contact. Nothing to take apart — unit-sealed construction.
- 12** A payment plan (purchase or rental) to meet the requirements of companies — large and small.

Write today—
WHEAT LAMP SALES, INC.
 1501 Kanawha Valley Bldg., Charleston, W. Va.

**SPECIALISTS IN MINE
 LIGHTING FOR 25 YEARS
 KOEHLER MFG. CO.**
 Marlboro . . . Mass.



TIMELY OPERATING IDEAS



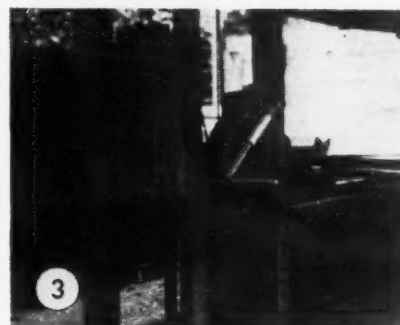
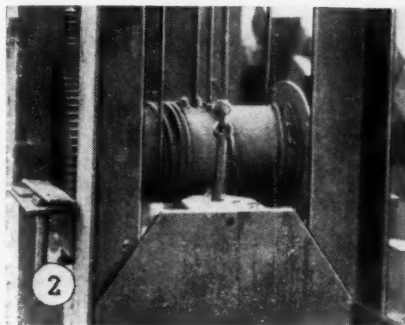
Balanced-Tank Tie Dipper Prevents Splashing

Now that commercially treated ties, props, crossbars and miscellaneous items of treated timber and lumber are very scarce, dipping and painting locally at the mine are on the increase. For convenience, speed, safety and conservation of chemical, the "balanced" dipping-tank outfit illustrated is in use at the mine shop and timber yard of the Blue Diamond Coal Co., Westbourne, Tenn., treating with creosote the ties used in Westbourne and Eagan mines.

While tank No. 1 is on the ground and full of ties and creosote the other is in the raised position and its soaked ties are draining. When the soaking and draining has been continued for a sufficient time, the drained ties are removed from No. 2 and a new batch is put in. During this refilling with untreated ties the absence of liquid obviates splashing of the creosote onto the men. The next step is to lower tank No. 2 and raise No. 1, thus starting the second half cycle.

The change of positions is done by a hand crank which is geared at low ratio to a drum accommodating the four wire ropes, two wrapping onto one side while the other two unwrap from the other. The steel posts are angles and, besides supporting the wire rope sheaves, roof and hoist, are guides for the tanks.

C. L. Coffey, chief electrician, Westbourne mine, collaborating with D. Sanders, superintendent of Westbourne and Eagan mines, built this machine.

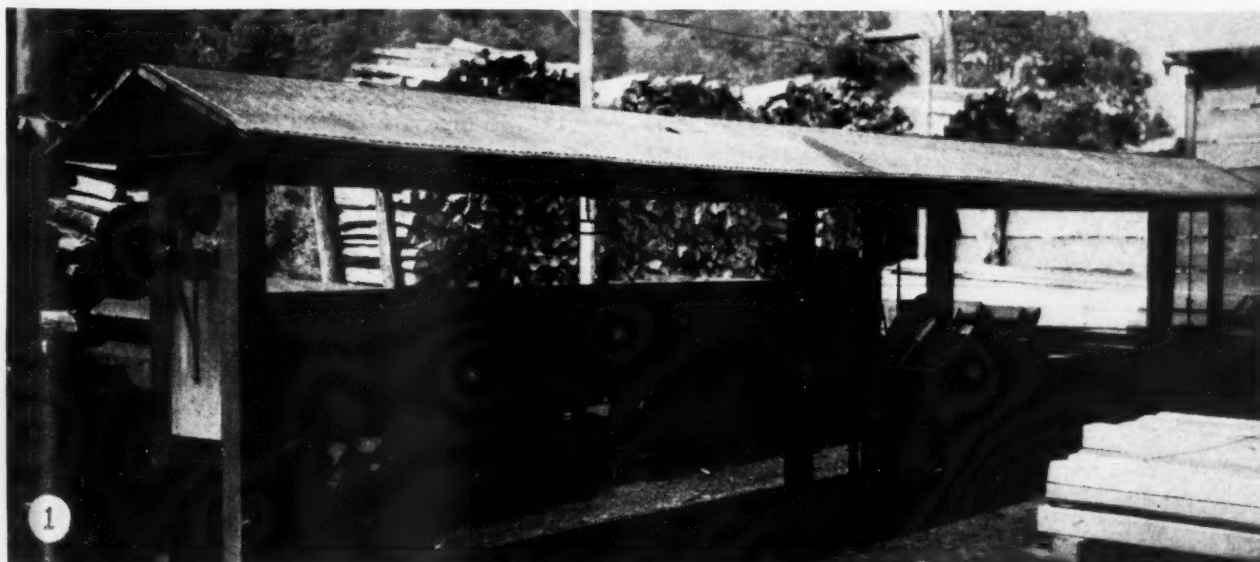
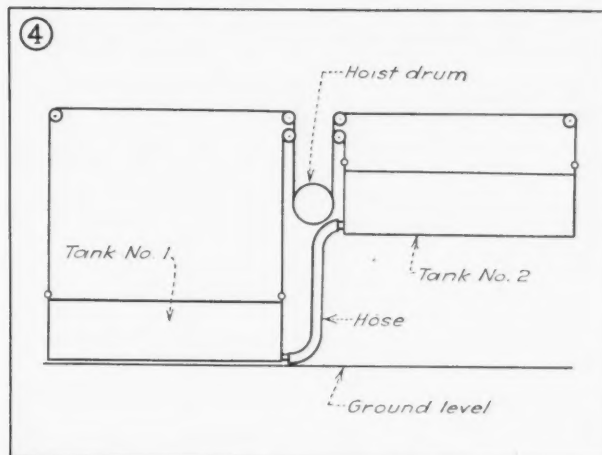


1
Dipping machine is in a timber yard close to the shop.

2
The hoist drum mounted between tanks accommodates four ropes.

3
Tanks are raised and lowered by a crank.

4
Schematic drawing of tank arrangement.

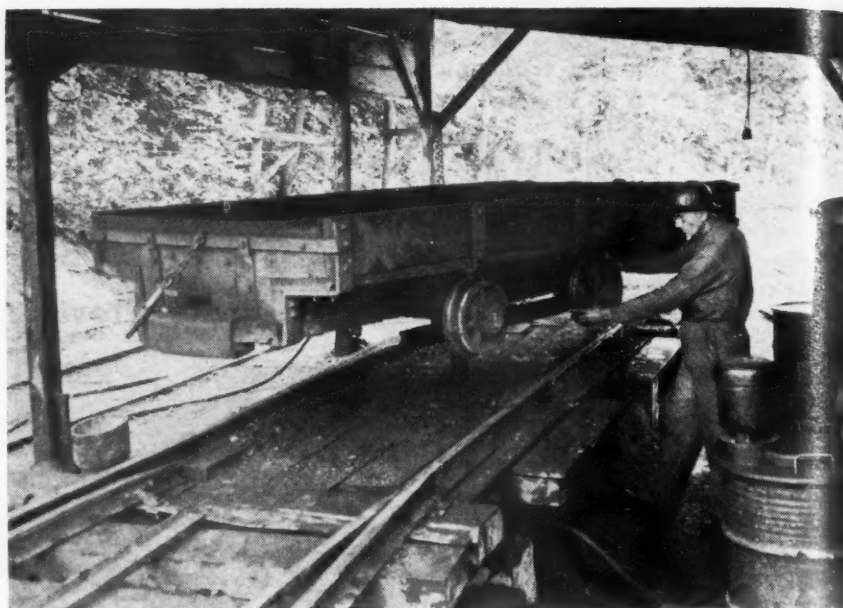


Mine Car Maintenance Hoist Uses Brake Cylinder

Bearings are the heart of a mine car, and so deserve the best of attention. The importance of proper lubrication is well understood but too often the adjustment of bearings is neglected and this neglect usually traces principally to a lack of proper facilities for raising the wheels free of the track and to a position convenient for checking the bearing play. Plenty of evidence exists, for instance, that a tapered roller bearing of proper size for the duty will last 10 to 20 years or more if kept properly adjusted and lubricated. An inexpensive tool for facilitating checking of bearing play at the time of lubrication is shown in the illustration herewith.

This simple, locally made hoist uses a 10x12-in. air-brake cylinder from an old-style freight car and the operating medium is air at 90 lb. pressure. In the arrangement pictured, which requires excavation of only a small pit 4 ft. deep below the center of the track, the main column or plunger on which the cradle is mounted is directly in line with the piston rod which pushes it up. For underground work where presence of water may complicate the construction and use of a pit, the cylinder can be placed at right angles to the plunger, mounted between track rails just to clear the car bottom and the motion transmitted by a bellcrank.

The photographs were made at Stanaford No. 1 mine (Raleigh County, West



Hoisted, wheels are free and whole car can be swung to any convenient position.

Virginia) of the Koppers Coal Division, Eastern Gas & Fuel Associates. This outside greasing and inspection station is equipped with an electric barrel pump and has a greasing hose connection on each side. J. L. Knight, chief electrician, who

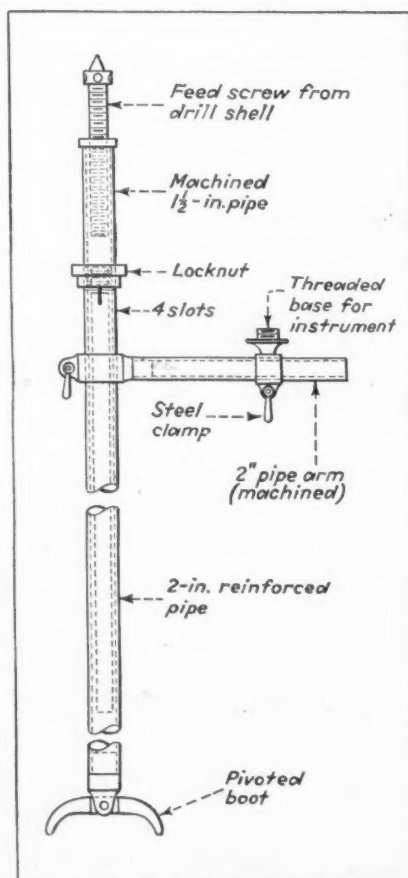
in the illustration is demonstrating the checking of a wheel bearing for end play, has installed this type of brake cylinder hoist at several mines with excellent results as measured by reductions in mine-car maintenance costs.

Transit Support Makes Underground Surveying Safer

Although use of the conventional tripod is satisfactory in surface surveying operations, it is fraught with numerous hazards underground. For instance, when working in drifts given over to haulage, work proceeds slowly because of interruptions, apart from the danger of the instrument being knocked down accidentally and perhaps broken. Range also is limited.

Realizing these handicaps, and wishing to make underground surveying safer and more rapid, J. Schober, manager, Tennessee-Schuykill Corp., Chloride, Ariz., developed and had constructed the novel and relatively inexpensive instrument support explained in detail in the accompanying sketch. It consists essentially of a circular steel column made from reinforced 2-in. pipe, with a pivoted boot at the lower end, a short length of 1½-in. pipe machined on the outside and containing a setscrew arrangement consisting of an old drill-shed feed screw and a movable side arm made from 2-in. pipe with an adjustable threaded base for the instrument proper.

The device can be used in drifts, raises and other underground workings. It has about 18 in. more range than the conventional tripod, cannot be knocked down, and when employed in drifts can be set up so as not to interfere with tramming, the mine cars passing under the side arm or the side arm being swung back if set at a low point. All parts were made from scrap materials at the mine machine shop at a moderate cost.



Smoothing the Path

This department is designed to promote low-cost operation by smoothing the path of operating, electrical, mechanical and safety men in the coal industry with selected examples of methods of reducing cost, increasing efficiency and furthering safety. Your assistance will go far toward enabling us to render the maximum possible service. So if you have developed a worth-while short cut, send it in, along with a sketch or photograph if it will help to make the idea clearer. For each acceptable idea COAL AGE will pay at least \$5 on publication.

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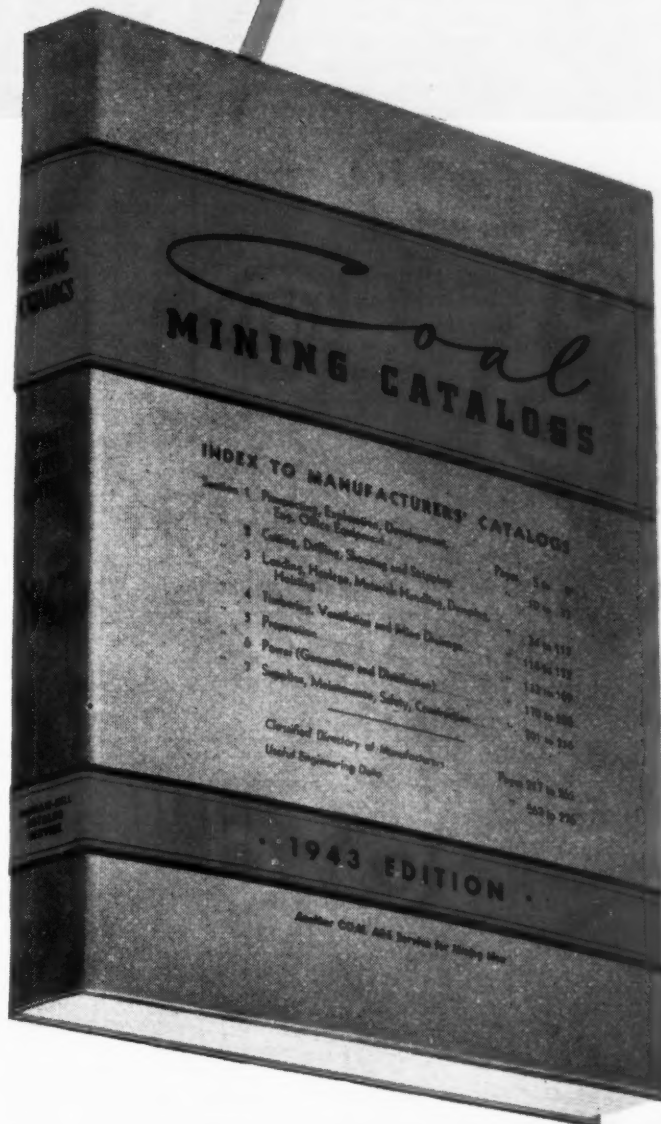
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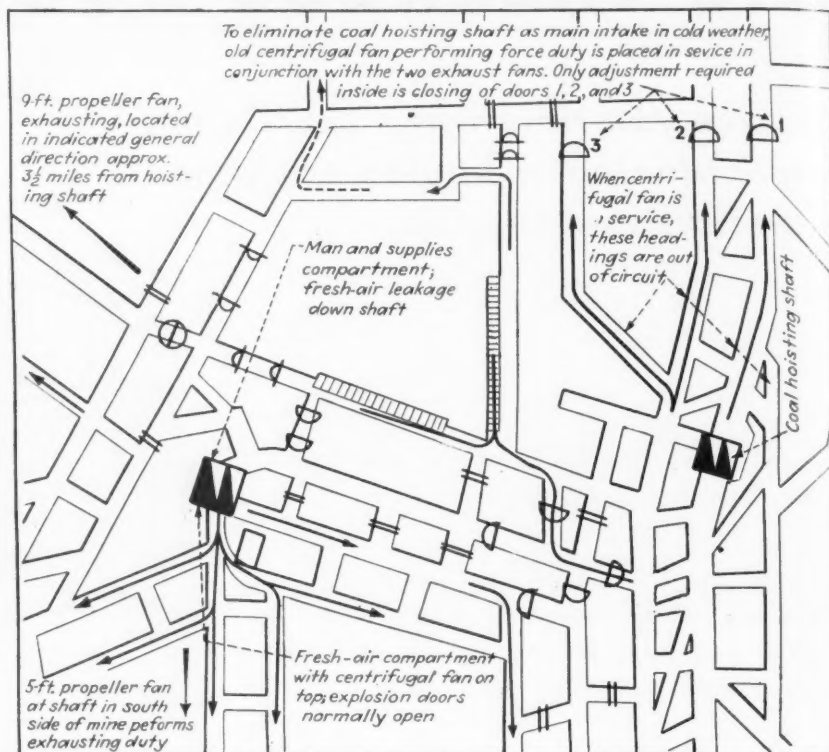
Company Name

City Address State

Fan Started and Doors Closed to Warm Shaft Bottom

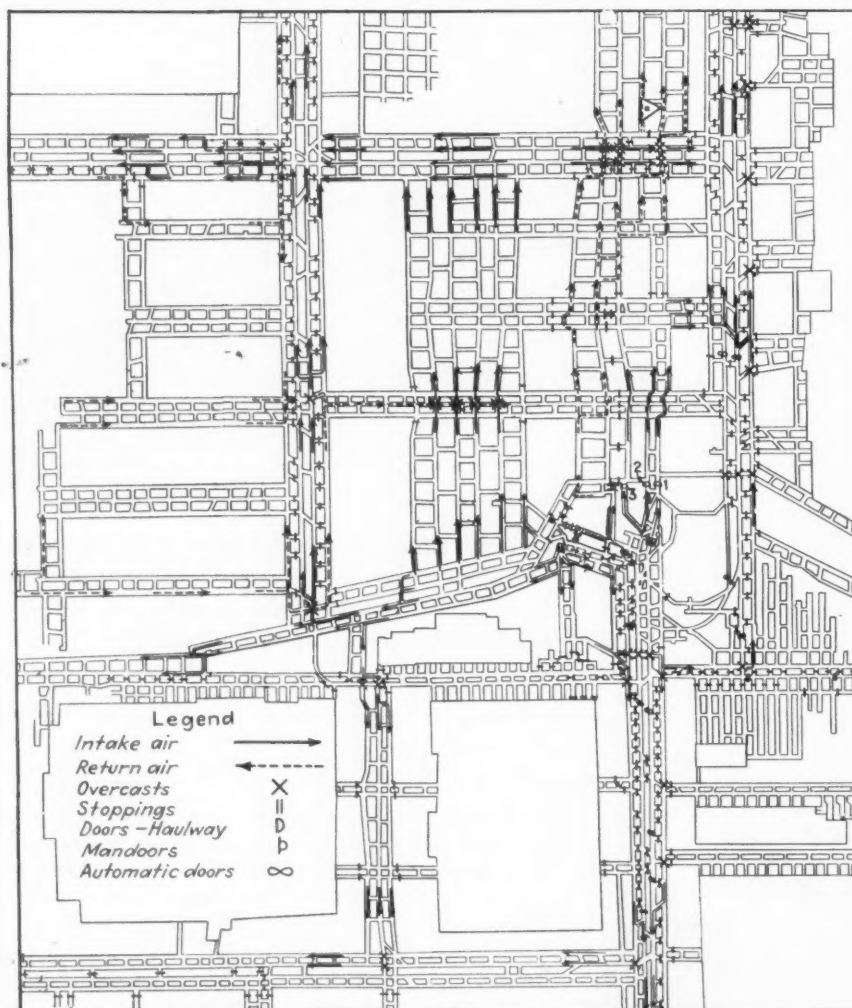
PENDING availability of materials for completing an air heating installation, an old fan at Federal No. 1 mine, Koppers Coal Division, normally held in reserve, is used as a means of warming the main bottom by reversing the air travel in the hoisting shaft from normal downcast to upcast (fresh air leakage) during cold months. The method is helping this northern West Virginia operation of Eastern Gas & Fuel Associates to maintain its place as the largest annual producer in the State in spite of the labor shortage in that general area. The mine is at Grant Town, in Marion County, and is gaseous like other deep operations in the Pittsburgh seam in that vicinity.

A new 11½x7-ft. centrifugal fan with direct-connected 350-hp. 257-r.p.m. induction motor was installed in 1928 to perform forcing duty at the top of a two-compartment auxiliary shaft which also serves for handling men and supplies. Three years ago that fan was taken out of service after two new exhausting fans were installed at outlying airshafts. Both of these new fans are propeller-type units, one 9 ft. in diameter and the other 5 ft. Normally the hoisting shaft bottom is at negative pressure, with air entering through



Doors Nos. 1, 2 and 3 are closed when the old fan is started. That reverses the air in the hoisting shaft without disturbing the remainder of the mine.

Ventilation as related to the bottom heating problem.



the 255-ft. hoisting shaft, through the air compartment of the auxiliary shaft (with old fan explosion doors open) and leaking from man-and-supplies compartment.

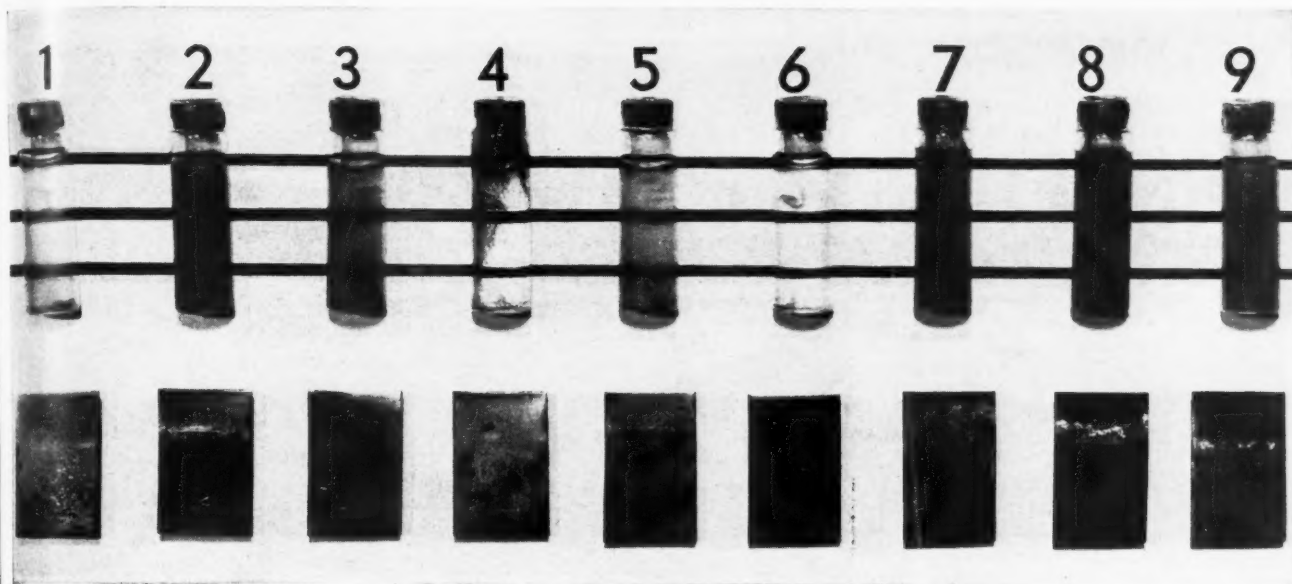
From the hoisting shaft to the auxiliary shaft is 400 ft. by straight line but close to 500 ft. via entry travel. The large volume of air entering the hoisting shaft and coursing the main bottom made it very cold and disagreeable during severe weather. To alleviate that condition, work was started on the installation of boilers and banks of heating-coil units at the top of the shaft but was held up for lack of priorities. It was then that the coal-company engineers proposed installation of three main doors and operation of the old fan as a temporary remedy.

The doors, within 275 ft. of the hoisting shaft, are indicated on the two accompanying drawings. Those installations were the only expenditures necessary. To put the plan into effect when cold weather comes, all that is necessary is to close those three main doors, close the explosion doors on the old fan and put that fan in operation. The 9-ft. propeller-type fan remains in operation at all times and the 5-ft. unit as needed. The greatly increased volume of air forced down the auxiliary shaft more than makes up for the loss of the hoisting shaft as an intake. A small quantity of the downcast air is bypassed onto the main bottom and up the hoisting shaft to provide the necessary local ventilation.

This Federal No. 1 mine produced a total of 2,065,667 tons during the year 1942. E. J. Weimer is general superintendent and Otto Heyer mine superintendent. General supervision of ventilation is handled by Stephen Krickovic, ventilating engineer, Pittsburgh.

TEST RESULTS

ANTI-CORRODE vs. Competitive Products



From an unretouched photograph.

To substantiate our convictions that Anti-Corrode is an unexcelled rust-preventive, nine steel strips were cut from a sheet of No. 18 B. & S. deep drawing steel which had been thoroughly cleaned mechanically. One strip, number 6, was dipped in Cities Service Anti-Corrode. Seven others were treated with leading anti-rust compounds according to their manufacturers' directions. One strip, number 8, used as the control, was not treated.

All strips were then partly immersed in small bottles of distilled water containing 3% Sodium Chloride. At the end of 90 hours they appeared as displayed above. Each test strip is shown before its bottle of solution. The rust penetration on each strip is plainly evident. The background lines behind the bottles enable comparison of rust density found in the solutions after test. The superiority of Anti-Corrode—number 6—is obvious.

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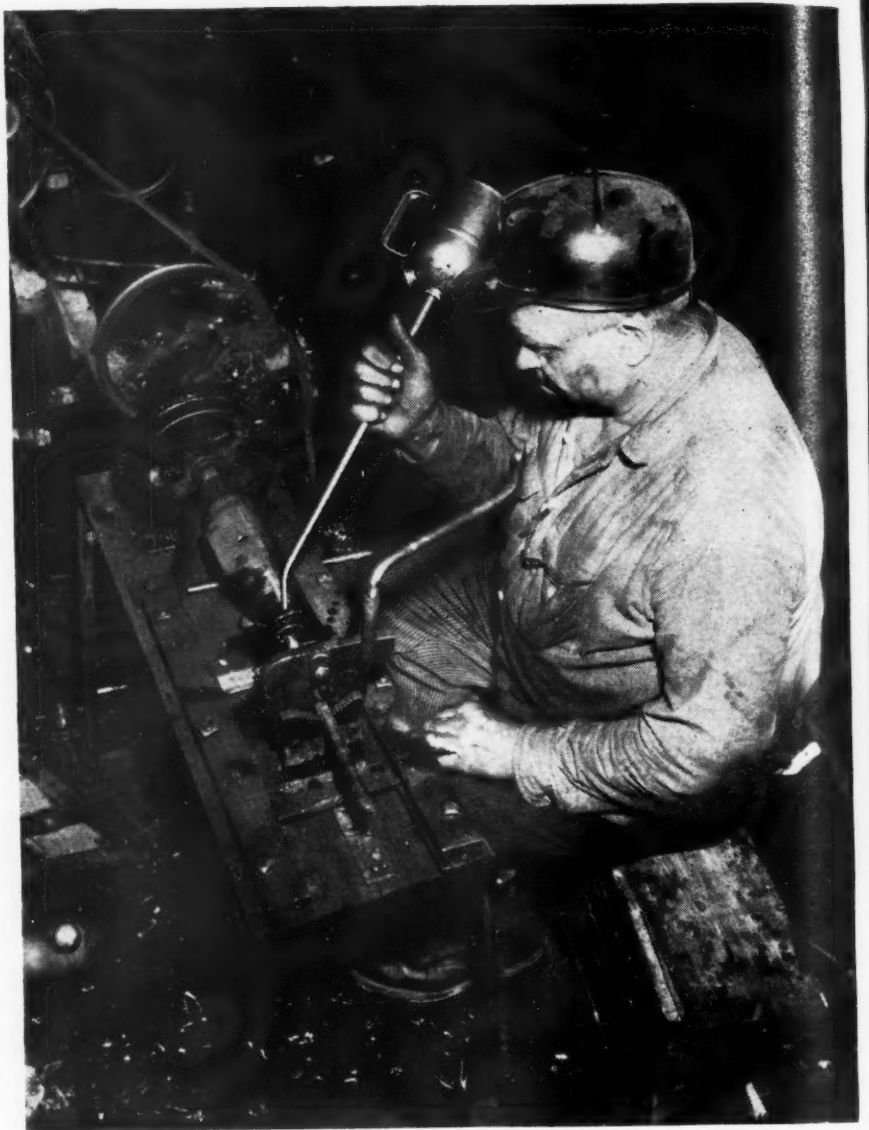
Built an Extension Threader Using Maytag Drive Unit

Twenty years ago mine mechanics drew heavily on Ford Model T parts for building or assembling tools or devices for special jobs, but only recently did there come to light a case of using in a similar manner parts of another milestone in American progress, the Maytag household washing machine. At the Van (W. Va.) mine of the Youghiogheny & Ohio Coal Co., where E. C. Berkeley is general superintendent, there is in regular use in the blacksmith shop a bolt threader which for the drive reduction and head uses a power unit from an old Maytag washer.

One of the jobs of N. A. Drow, blacksmith for the Van mine, is to make and keep a supply of extension rods for trolley hangers, thus removing the temptation for underground men to indulge in the expensive makeshift of using extra hangers as spacers where the roof is too high. The shop, serving but one mine, had no bolt threader and Mr. Drow got tired of the endless and slow job of threading the extensions by hand. The machine he is working and "enjoying" in the illustration he built as the solution to his problem. While its special mission is to thread these hanger bolts, which range from 10 to 18 in. in length, he uses it for any threading of rods or bolts $\frac{3}{4}$ in. and smaller.

The die holder consists of a section of pipe or tubing welded to the shaft of the gear of the Maytag unit. This gear wheel carried the crankpin for the washer connecting rod. The vise holding the bolts consists of three jaws from a pipe vise. The upper is held down by a crank screw operating in one end of the body of a turnbuckle.

It takes power to thread bolts and the energy a workman would normally expend in a whole day doing that work by hand would be approximately 7/20 of one kilowatt-hour. That much electric power costs about 1c! Besides saving in man fuel (beans, steak, etc.) the threading is done faster and straighter.

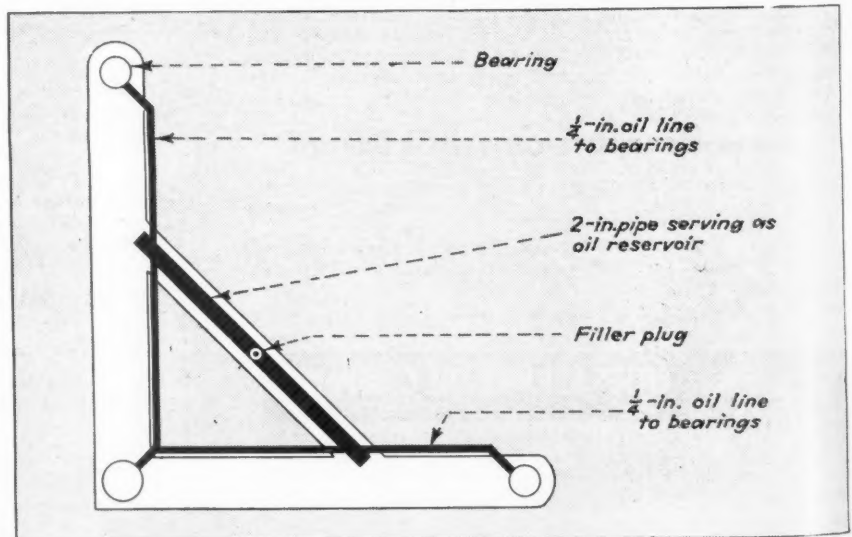


Change to Oil Lubrication Improves Bellcranks

Lubrication of the bearings of bellcranks used to drive the 90-deg. pan lines of shaker conveyors in Blocton No. 9 mine of the Black Diamond Coal Mining Co., Bibb County, Alabama, was improved by substituting for the original pressure-gun grease fittings a system using heavy oil and one which feeds automatically and in proportion to the use.

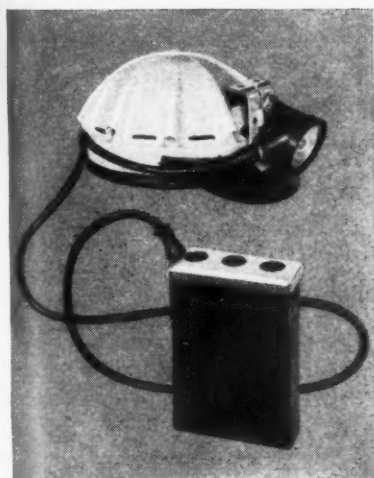
Referring to the drawing, the shaded parts are the oil pipes which have been added to the bellcrank. That on the brace is a 2-in. pipe which is the reservoir and contains a filler plug at the center. Other pipes leading to the bearings are $\frac{1}{4}$ -in. size. Flow to the individual bearing is adjusted by the simple expedient of pinching the end of the $\frac{1}{4}$ -in. pipe. The oil used is S.A.E. No. 70.

On the brace is a 2-in. pipe serving as a reservoir and from it $\frac{1}{4}$ -in. pipes lead to the bearings.





Interior view of lamp house of the Y & O Coal Company, Cadiz, Ohio.



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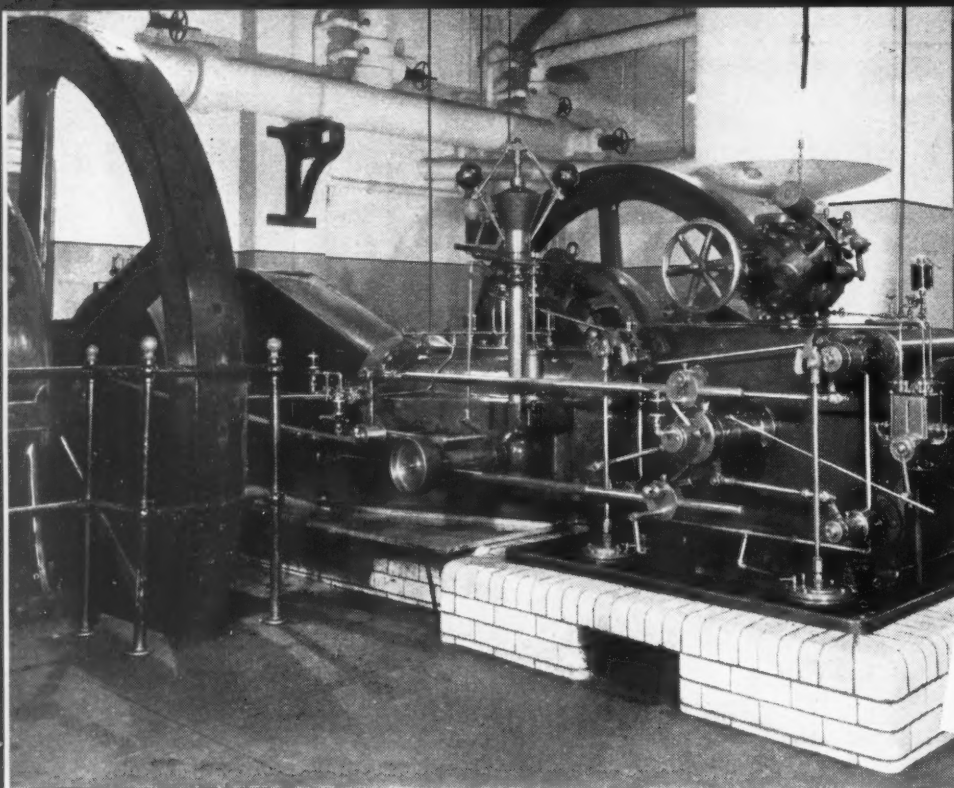
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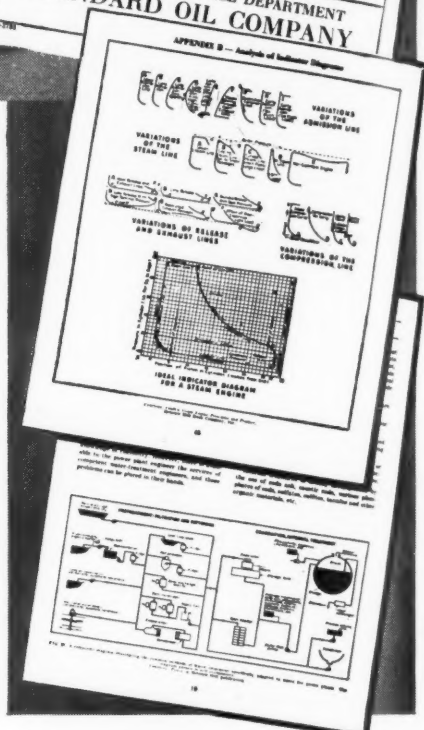
ENGINEERING BULLETIN

FOR THE INSTRUCTION OF INDUSTRIAL SALESMEN

STEAM ENGINES AND THEIR LUBRICATION

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Send for this bulletin. "Steam Engines and Their Lubrication" discusses such subjects as steam conditions and their relation to lubrication, analysis of indicator diagrams, and methods of oil atomization. It may help to clear up specific troubles you are now having.

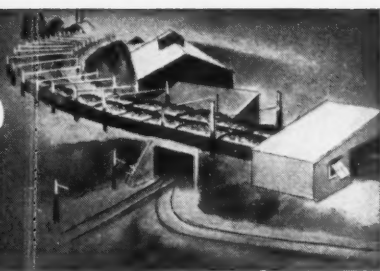
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COAL AGE NEWS ROUND-UP



U.M.W. and Illinois Operators Sign New Pact With 8½-Hour Day Including Travel Time

TWO WEEKS after informal resumption of negotiations for a new wage contract by Appalachian operators and John L. Lewis, United Mine Workers president, in Washington, Illinois operators signed another pact on Sept. 23 with U.M.W. providing for an 8½-hour work day, including travel time from mine entrance to working face. The new agreement increases average daily earnings about \$1.75, as follows: \$5 extra a week to cover five additional hours at straight time over 35, plus time and a half for 2½ hours over 40, since the work week in the new contract will be 42½ hours. The overtime adds \$3.75 to the pay, making the average for a 5-day week approximately \$8.75. This is in addition to 25c. a day already allowed to cover lamps, tools, etc. The agreement, replacing the one signed July 20 and disallowed by the War Labor Board Aug. 13 (September Coal Age, p. 98), was taken under consideration by WLB.

Under the prevailing arrangement for a 35-hour week, the miners receive an average of \$35 for five days' work or \$45.50 for six days with overtime on the sixth day. With the 25c. daily allowance by WLB added the earnings average is \$47 for six days.

The new agreement, which was unanimously approved by the union policy committee, also provides that the seven-hour day for outside workers shall be lengthened to eight hours with time and one-half for overtime, increasing the estimated earnings of these men some \$1.29. Hourly rates both underground and on the surface were left unchanged. The contract also provides a flat payment of \$40 to each miner in settlement of portal-to-portal pay from April 1, 1943, when the old contract expired, to the end of the second suspension on June 20.

Former Senator Edward N. Burke, representing southern operators, characterized the contract as another attempt to circumvent the national wage standardization policy, asserting that it was another wage increase promising serious repercussions and making it impossible for high-cost mines to operate.

There were further legal developments in the portal-to-portal issue. In its answer to a suit in Federal District Court at Abingdon, Va., by the Jewell Ridge Coal Corp., Tazewell, Va., the U.M.W. maintained that time miners spend in traveling to their jobs within mines is really work time because they are then subject to the

control and supervision of the mine operators. District 19, U.M.W., operating in eastern Tennessee and southeastern Kentucky, filed suit Sept. 7 at London, Ky., against the United States Coal & Coke Co., controlled by the United States Steel Corp., to test the portal-to-portal pay issue. William Turnbull, president of District 19, said that U.M.W. demands pay at time and one-half rates for time spent in traveling to and from working faces on company properties by all men employed by the company since Oct. 24, 1938, the date on which the Fair Labor Standards Act became effective. The defendant company's plant, at Lynch, Ky., employs about 2,100 men under U.M.W. jurisdiction.

Two other suits seeking declaratory judgments were filed by the UMW at Charleston, W. Va., one against the Smet-Solvay Co. and the other against the New River Co. The union states that more suits will be instituted in Pennsylvania and other states as soon as the cases can be prepared.

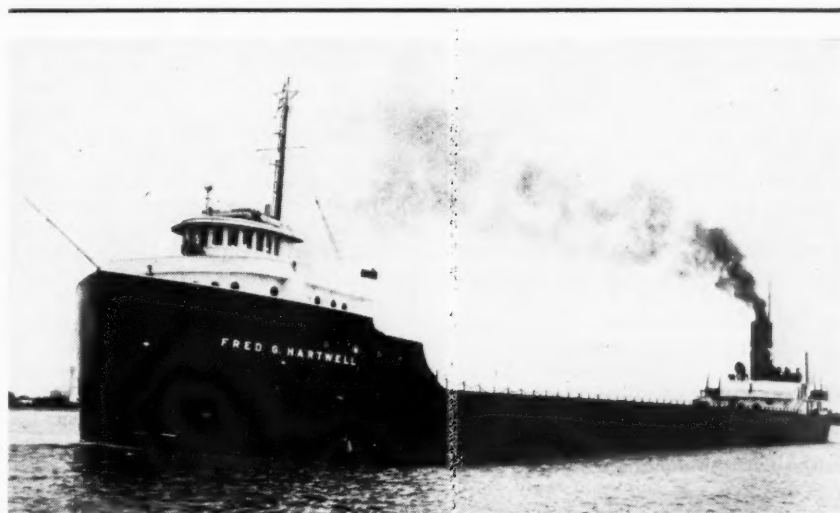
Although soft-coal production by Sept. 12 last had caught up to and passed the total to that date a year ago by over 7,000,000 tons, output continues to be hampered by intermittent strikes. There were walkouts at three large mines in east-

ern Ohio in late August over portal-to-portal pay. About 2,000 employees of the Hanna Coal Co. and Powhatan Mining Co. were involved. A stoppage at the Parrish mine of the Railway Fuel Co. in Alabama involving about 550 men, who refused to enter mines returned to their owners by the government because the workers said they had no contract, was settled after nearly a week's idleness.

Although the eight-hour day was authorized by the War Labor Board and approved by President Roosevelt Aug. 16 (September Coal Age, p. 98), the order had not yet been invoked in September. Secretary Ickes stated that government-controlled mines had not been ordered on a 48-hour week because a serious question existed as to its advisability. Sentiment among operators on the order was mixed, though a majority were opposed to it. Lewis, who conferred with Acting Secretary of the Interior Fortas on placing the order in effect, cited a number of difficulties involved in its introduction.

In reply to a request by Mr. Fortas for advice as to interpretation of three provisions of the order authorizing the eight-hour day William H. Davis, chairman of W.L.B., wrote as follows:

"1. The Board's order does contemplate that as to mine workers paid on a tonnage, yardage, deadwork or other piecework basis rate and one-half is to be paid, and such workers may be paid at the existing rates for seven-eighths of the output produced during the eight-hour day



Str. "Fred G. Hartwell," flagship of the M. A. Hanna fleet of 14 bulk freighters, set a new record in September by carrying a cargo of 15,875 tons of bituminous coal to Duluth, Minn., the largest cargo of coal ever delivered to the head of the lakes. The previous record cargo, of 15,861 tons, also was carried by the "Hartwell."

and at rate and one-half for the remaining one-eighth of the output produced during the day.

"2. Whether the operators of mines not in the Secretary's possession, or government possession of whose mines has been terminated, may initiate or continue in effect the eight-hour day with the payment at the rate of time and one-half and rate and one-half for the eighth hour depends upon the terms of their existing contract with their employees. Operators who prior to April 1, 1943, were operating under the contract with the United Mine Workers which provides for a seven-hour day may by mutual agreement with the mine workers extend the working time to eight hours a day with payment at the rate of time and one-half and rate and one-half for the additional hour. The payment of overtime premium within these limits is within the terms and spirit of that contract and is not a wage increase requiring the approval of the National War Labor Board.

"3. The provisions of the Board's order for 'payment at the rate of time and one-half for the additional hour of work on any day, when the eight hours a day are worked in conjunction with a 48-hour work week' is to be interpreted to permit such payment whenever the mine is operating in good faith on a 48-hour work week schedule. The order does not prevent payment to mine workers at the rate of time and one-half and rate and one-half for the additional hour of work on any day: (1) in cases where the mine is being operated on a 48-hour week schedule but the operator or operators, because of lack of market demand, breakdown of equipment, accidents, shortage of transportation, or other similar causes beyond their control, are prevented from operating on one or more days during the week; or (2) in cases where the mine is being operated on a 48-hour work week schedule but individual mine workers fail to report for work on one or more days during the week."

Adjust Pay of Non-Union Men

The Labor Board on Sept. 4 authorized bituminous operators to pay clerical and supervisory employees not U.M.W. members time and one-half for overtime in excess of 35 hours a week. The board approved this extension of overtime benefits to non-union workers to restore a differential in weekly earnings which was removed or reduced when the miners went on a six-day week. The operators also were authorized to raise the wage rates for the non-union workers to not more than 50c. an hour without additional W.L.B. approval. These wage adjustments may be made retroactively to the date on which the six-day supplemental agreement between the operators and U.M.W. took effect in each district, the board ruled.

Unless more manpower can be quickly recruited for the mines serving the Pacific Coast and Rocky Mountain States, a shortage of coal can be expected there this winter, Coal Mines Administrator Harold L. Ickes declared Sept. 20. The adequacy of the coal supply in these states, he said, will depend in large part upon the response of former miners to the War Man-

power Commission's drive to recruit 3,000 able-bodied men to work in the mines serving that territory. Coal requirements in the Pacific Coast and Rocky Mountain States are outstripping production in the states serving them, The Administrator explained.

In orders sent Sept. 13 to U. S. Employment Service offices Paul V. McNutt, chairman of the War Manpower Commission, said that a minimum of 3,000 men were needed urgently to meet a shortage of coal miners in Colorado, Montana, Utah, Washington and Wyoming. Chairman McNutt directed that men be recruited from eastern mines working less than 48 hours a week. Mr. McNutt turned down the request of Secretary Ickes that WMC ask the release of miners from the army to return to undermanned anthracite mines.

A campaign was scheduled to be launched Sept. 13 at Harlan, Ky., by W. H. Fraysure, State Manpower Director, to recruit more miners for work in Kentucky coal fields to boost production. He said that at least 6,000 additional men were needed to fill vacancies caused by shifts to other jobs or military service.

J. Dan Talbott, assistant director of the War Manpower Commission in Kentucky, announced Sept. 22 at Frankfort that operators and miners in four districts of eastern Kentucky have signed an agreement pledging their mutual efforts to increase coal output, regardless of labor shortage.

The gist of the agreement, according to

Talbott, is that both the miners and operators have agreed to do the best they can with what they have, and hope to get away from big reductions in production in the latter days of the week, caused by absent workers. This has been especially true of Saturday production. For example, it is held that the Harlan field can produce 900 cars of coal on Thursday, the Hazard field 700 cars; but by Saturday Harlan tapers off to 500 cars and Hazard to 400 cars. If Saturday production can be pulled up it will materially improve the situation.

Talbott was assigned the task some weeks ago of trying to improve the manpower situation or get more coal produced. He held that instead of finding trouble in the mountains he found cooperation from both sides. A five-point program of mutual cooperation has been signed by union leaders and operator officials representing Harlan, Hazard, Big Sandy, Elkhorn, and the Williamson (W. Va.) coal operators' organizations.

Anthracite producers and U.M.W. representatives resumed consultations Aug. 26 on a new scale with a division of W.L.B. The conference began in the private office of Chairman Davis, the conferees including, besides Mr. Davis, William Waldron, assistant to Mr. Davis; Van Bittner and Matthew Woll, labor members of W.L.B.; W. W. Inglis, R. E. Taggart and James H. Pierce, operators; and Thomas Kennedy and Martin F. Brennan, U.M.W.

Six Field Offices Established by Ickes To Supervise Bituminous Distribution

CLOSER government supervision of wartime coal distribution was evidenced during September through various orders of the Solid Fuels Administration for War, most important of which was establishment of six field offices in Boston, Cincinnati, Cleveland, Denver, Kansas City and Philadelphia to deal with bituminous distribution.

In addition to these offices, Secretary of the Interior Ickes also announced that the Seattle (Wash.) office of the SFA would be expended to deal solely with distribution problems in the Pacific Northwest. Offices in the East also will be responsible for providing an adequate supply of bituminous if the anthracite supply falls to a point where such action is necessary.

William H. Hahman, Chevy Chase, Md., technical adviser to the Solid Fuels Administrator since 1942, will be in charge of the bituminous coal distribution unit at Washington.

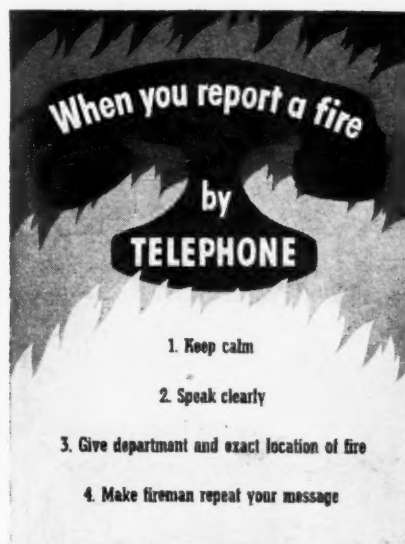
Named to head the field offices were: Boston, Borden Covell, Brookline, Mass., for New England; Cincinnati, Wayne P. Ellis, Fort Thomas, Ky., for South Carolina, Georgia, Tennessee, Kentucky, part of Michigan, part of Ohio, and for distribution of southern coals in Indiana and Illinois; Cleveland, Howard A. Smith, Lakewood, Ohio, for northern Ohio; Denver, Robert B. Griffith, for Colorado, New Mexico, Arizona, Nevada, and California; Kansas City, Mo., Frederic I. Halstead,

Kansas City, for Missouri, Nebraska, Oklahoma, Arkansas, and Texas; Philadelphia, Robert A. Magee, Hyattsville, Md., for Maryland, Delaware, District of Columbia, Virginia and the eastern West Virginia Panhandle; Seattle, James T. Hill, Sheridan, Wyo., for Washington, Oregon, Idaho, Utah, Montana and Wyoming.

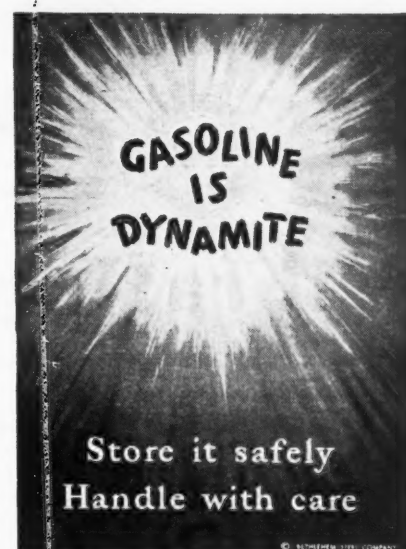
In line with the distribution plans, the Bituminous Coal Producers Advisory Board of Illinois announced formation of an allocation plan which J. R. Henderson, chairman of the Board, said was the first one worked out in the nation. Large and small producers will contribute to emergency demands on a percentage basis. SFA has asked for 200,000 tons of Illinois coal on an emergency basis.

Meanwhile, as the anthracite distribution plan went into effect in the East, the Office of Price Administration announced provisions against dealer discrimination against new customers, in cases where consumers found they had no previous dealer from whom to buy. Dealers must serve new customers if the customers can show that their former dealers are no longer able to serve them, if they can meet the dealer's credit requirements, and if they reside in his area.

The maximum quantity of anthracite which can be delivered to consumers in the Eastern limitation area will be figured separately for each cooking or heating unit customarily burning different sizes of anthracite, OPA announced Sept. 23. Other



*fighting
fires
with*



POSTERS



Bethlehem has long had an efficient fire-fighting organization. But war conditions multiply normal fire hazards. Thousands of new employees have come to work. Large additions have been made to existing facilities, and entire new departments set up. At the same time, war needs have intensified the pressure for production.

Since the start of the war emergency Bethlehem has redoubled its effort to keep down production loss due to fires. Much new equipment has been provided: extinguishers, alarm boxes, sprinkler

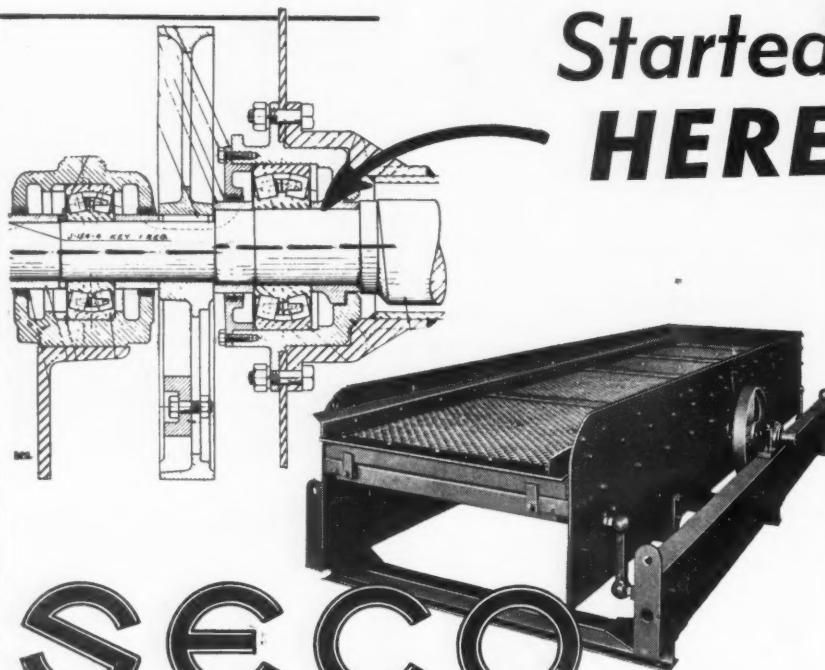
systems, hose outlets and fire engines. And as plants grew, fire-fighting personnel was expanded, and given special training.

A poster campaign, of which a few representative samples are shown on this page, is one im-

portant detail of this program. Each poster registers in the employee's mind a single, specific point in fire-fighting or fire-prevention. Prominently displayed in steel plants, shipyards, fabricating shops, these posters are helping to maintain a favorable fire-loss record through the war years.

A fire on the production front can cost American lives on the battlefronts. Even seemingly trivial fires have a grave cumulative effect. The aim is to prevent fires from occurring at all—and, if they do occur, to make them die young.

Gyratory Motion Started HERE



SECO Vibrating Screens

The circular gyratory motion of SECO SCREENS—positively controlled—has proven its ability to deliver the largest capacity per sq. ft. of area—at lowest maintenance cost.

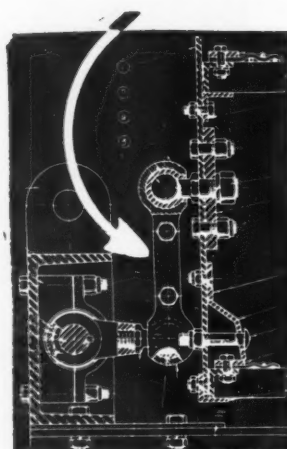
Its positive control—an exclusive feature—makes this greater output possible.

We invite Preparation Men to investigate the "Control of Motion" built into all SECO Screens—giving quiet and smooth operation together with its higher efficiency and lower maintenance cost. Every square inch of screening surface moves in exactly the same plane. It has to.

Is Controlled HERE

Send for the
descriptive book

on SECO VIBRATING SCREENS, giving
full mechanical details and complete in-
stallation dimensions.



changes in Ration Order 19 (Anthracite Coal) made by an amendment issued the same day provide that persons having two or more buildings burning anthracite which were not served by common storage facilities on Sept. 22 may compute their inventories for each building individually.

As a consequence of increased supplies, SFA has removed restrictions on the shipment of No. 2 buckwheat (rice) anthracite in Amendment No. 1 to Revised Regulation No. 2. Under SFA Revised Regulation No. 2, shipments of this size of coal from producers and wholesalers to dealers had been limited to 90 percent of the amount shipped from April 1, 1942, to March 31, 1943. At the same time the SFA asked OPA to remove the restrictions placed upon retail deliveries of this size to consumers under Ration Order No. 19, which limits delivery of anthracite in 12 Eastern States and the District of Columbia. Amendment No. 1 also places the same shipment and delivery restrictions on "broken" anthracite, not previously covered in Revised Regulation No. 2.

Keeping Step With Coal Demand

Bituminous Coal Stocks

	Thousands Net Tons	P.C. Change From July 1	P.C. Change From Aug. 1
	Aug. 1 1943	1943	1942
Electric power utilities.	18,700	-0.6	+7.8
Byproduct coke ovens.	6,819	-4.5	-31.3
Steel and rolling mills.	919	-7.3	-21.9
Railroads (Class 1)....	12,574	+5.1	-2.5
Other industrials*.....	29,107	+2.9	+5.2
Total.....	68,119	+1.3	-1.3

Bituminous Coal Consumption

	Thousands Net Tons	P.C. Change From June	P.C. Change From July
	July 1943	1943	1942
Electric power utilities.	6,481	+7.6	+13.5
Byproduct coke ovens.	7,491	+4.3	-0.17
Steel and rolling mills.	855	+3.8	+12.8
Railroads (Class 1)....	10,198	+3.5	+12.3
Other industrials*.....	11,477	+0.8	+1.9
Total.....	36,502	+3.5	+6.3

* Includes beehive ovens, coal-gas retorts and cement mills.

Coal Production

Bituminous	
Month of Aug., net tons.....	51,700,000
P.c. change from August, 1942.....	+8.0
Jan.-Aug., 1943, net tons.....	389,134,000
P.c. change from Jan.-Aug., 1942.....	+2.3

Anthracite

Month of Aug., net tons.....	5,624,000
P.c. change from August, 1942.....	+7.9
Jan.-Aug., 1943, net tons.....	40,463,000
P.c. change from Jan.-Aug., 1942.....	+0.4

Sales of Domestic Stokers Vs. Oil Burners

	Coal Stokers	Oil Burners
July, 1943.....	2,325	892
P.c. change from July, 1942.....	-66.8	-59.7
January-July, 1943.....	14,143	11,168
P.c. change from Jan.-July, 1942.....	-75.4	-73.1

Index to Business Activity*

Week ended Sept. 17.....	212.3
P.c. change from month earlier.....	+0.6
P.c. change from year earlier.....	+12.9

* Business Week, Sept. 24.

Electric Power Output†

Week ended Sept. 18, kw.-hr....	4,358,512,000
P.c. change from month earlier.....	-2.2
P.c. change from year earlier.....	+16.0

† Edison Electric Institute.



*Loaders will give
you maximum production if you give
them proper care!*



**Call in a Gulf Lubrication Service
Engineer for effective help in keeping
your loading equipment up to peak
production**

One answer to the problem of getting more production from your loaders is to make sure that a minimum of productive time and effort is wasted due to shutdowns and below par performance caused by excessive wear.

Here Gulf can give you effective assistance. With a large staff of trained lubrication service engineers—and quality oils and greases that provide greater protection—Gulf is well prepared to help you install the kind of lubrication practice that will insure more

efficient loader performance and fewer production lags caused by breakdowns and mechanical troubles.

Many mines have found that the savings in maintenance costs alone with Gulf Lubrication more than covers the entire lubrication bill. So call in a Gulf Lubrication Service Engineer now and adopt his recommendations for the proper application of the right lubricants. This action will insure many benefits in your mine. Write, wire, or phone your nearest Gulf office today.

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FOR VICTORY BUY UNITED STATES
WAR BONDS AND STAMPS



"It's a FIST-GRIP on Hitler's Throat... Saving Fighting Metal, Speeding the Job..."



"Yes, we use Laughlin 'Fist-Grip' Safety Clips," says this Super. "Three of them do the work of four U-bolts, and they don't crimp and injure wire rope that we want to re-use."

Another says: "The 'finger-pinch' U-bolt clip wastes rope and clips. This 'Fist-Grip' Clip will help choke Hitler by saving time and metals."

These 3 Savings on the Job Mean More Guns, More Bullets

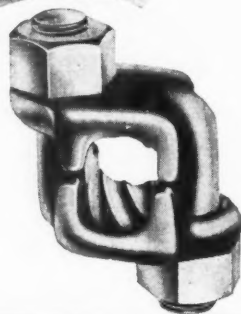
Saves Accidents — can't be put on wrong even by inexperienced men; doesn't weaken rope; greater holding power.

Saves Metals — 25% fewer clips do the job better, saving steel; no crushed rope ends; flush nuts — no battered threads.

Saves Time — fewer clips needed; nuts on opposite sides tighten easier, faster with any type wrench.

**Greater holding power
with 25% fewer clips**

*Distributed Through Mill Supply Houses
Look for Laughlin Products in
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U-BOLT CLIPS

Unavoidably crimp, distort and bow wire rope with this "finger-pinch" action, causing reverse strains when load is applied.



LAUGHLIN "FIST-GRIP" SAFETY CLIPS

Hold rope in smooth, vise-like grip, with no reverse bends under load and no protruding threads to become battered and spoiled.

**THE THOMAS
LAUGHLIN
Company
PORTLAND, MAINE**



COMING MEETINGS

- American Institute of Mining and Metallurgical Engineers and American Society of Mechanical Engineers: joint fuels conference, Oct. 28 and 29, William Penn Hotel, Pittsburgh, Pa.
- Illinois Mining Institute: 51st annual meeting, Nov. 12, Hotel Abraham Lincoln, Springfield, Ill.
- Harlan County Coal Operators Association: annual meeting, Nov. 17, Harlan, Ky.
- American Society of Heating and Ventilating Engineers: 50th annual meeting, Jan. 31, Feb. 1 and 2, 1944, Hotel Pennsylvania, New York City.

Fifteen producers and wholesalers were ordered by the SFA to allocate 165,000 tons of anthracite during Sept. to ten wholesalers to correct shortages in domestic supplies. The order was taken as a result of a recommendation by the Anthracite Supply and Distribution Committee and was the first large-scale allocation undertaken. The order affected dealers in Philadelphia, Boston, Wilkes-Barre, Pa., and New York City.

Appointment of eight men to carry out the anthracite distribution program was announced by SFA. Named as chief of anthracite distribution was Robert F. Duemler, on leave of absence as assistant to the president of the Delaware, Lackawanna & Western Coal Co. Others appointed were:

Walter J. Dockerill, New Rochelle, N. Y., for Region 1, including New York City, Westchester, Nassau and Suffolk counties; James H. Farrell, Rochester, N. Y., for Region 2, including the rest of New York State except Richmond County; Daniel F. Gallagher, West Orange, N. J., for Region 3, including New Jersey and Richmond County; Edwin L. Willson, Toms River, N. J., for Region 4, which includes all of Pennsylvania; Walter A. Henderson, Swampscott, Mass., for Region 5, which includes New England; Arthur D. Hill, Baltimore, for Region 6, which includes Delaware, Maryland, District of Columbia and states east of the Mississippi and south of the Ohio River; John S. Magee, Baltimore, stationed at Wilkes-Barre, Pa., as enforcement official.

At the same time, OPA announced clarification of the anthracite distribution system emphasizing that householders were not restricted to 50 percent of last year's supply but that they could purchase only 50 percent of their 1943 allotment at any one time. OPA said the principal reason for the system was to assure some coal in each cellar before coal weather starts.

Mr. Ickes declared Sept. 18 that every coal consumer in the United States will find it necessary to cut his usual fuel consumption during the forthcoming burning season to insure enough coal for war industries, to avoid personal discomfort

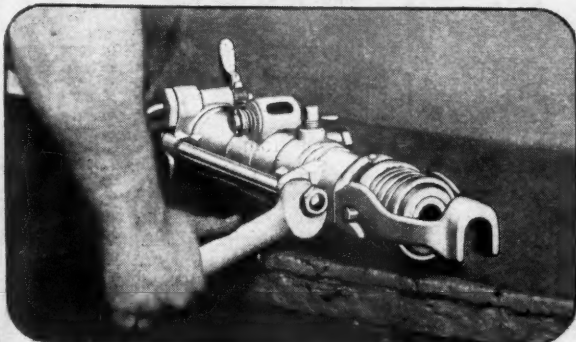
Elementary Care of C-P Sinkers

KEEPS THEM AT TOP SPEED

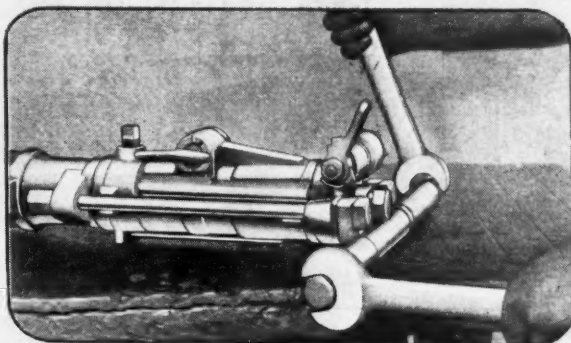


CP Rock Drills are noted for fast drilling, but to keep them operating at their best they should be lubricated and tightened regularly. Drilling speed for example will be lost if side rod nuts are loose or unevenly tightened. This may pinch valve and chuck parts, and cause drills to leak air. Give your CP Sinkers simple, intelligent care, particularly as suggested below.

HOW TO GET MAXIMUM SERVICE FROM YOUR C-P SINKER DRILLS



1 Keep side rod nuts evenly tightened. Check weekly to maintain economical performance.



2 Handle bolt nuts should be kept well tightened in order to facilitate the handling of the drill.



3 Too long or too short drill shanks will affect piston travel and cut down the drilling speed.



4 If drilling wet, keep water tube plug tight so water cannot enter cylinder and wash out oil.

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(Nicycle...Universal)
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now does away entirely with the hat
method of collecting real money to
help out a fellow Employee hit by
emergencies.



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and complete insurance protection, built on a
scientific basis, that can bring them financial
help to meet the emergencies caused by

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- **Loss of time due to Sickness and Accident**
- **Dismemberment**
- **Aiding dependents upon death of employee**

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- Bringing HUMAN SECURITY Plans to Employees of
the Coal Mining Industry for more than a half-century.

from lack of heat during the winter, and
to provide for possible shipment to the
Army in liberated territory.

The amount of coal forwarded for dis-
tribution into three important consum-
ing areas during the week ended Sept.
11 decreased slightly compared with the
previous week, Secretary Ickes announced
Sept. 21. Coal forwarded during the week
to New England, the upper Great Lakes
docks, and the Pacific Northwest was
1,960,537 tons, or 152,957 tons less than
during the previous week. A total of 519,-
680 tons of both anthracite and bitu-
minous coal was forwarded to New Eng-
land during the week. Of this total 116,950
tons was anthracite, a drop of 35,585 tons
below forwardings of the previous week.
The 402,750 tons of bituminous coal
forwarded to New England was 53,691
tons less than in the previous week. An-
thracite forwardings to New England for
the year as of Sept. 11 totaled 4,632,595
tons, a decrease of 310,750 tons compared
with the same period last year. Bituminous
forwardings for that period were 16,926,-
696 tons, or 253,299 tons above the total
for the same period in 1942.

Eastern coal forwarded to the Great
Lakes docks during the week ended Sept.
11 totaled 1,387,387 tons, compared with
1,445,713 tons for the previous week.
However, the coal forwarded in the week
of Sept. 11 this year was 152,383 tons
greater than the total forwarded in the
same week last year. A total of 28,746,-
049 tons of coal has been forwarded to
the upper docks to date this year, compared
with 32,154,810 tons last year, or a de-
crease of 3,408,761 tons.

Coal forwarded to Washington and
Oregon from out-of-State mines during the
week ended Sept. 11 totaled 53,370 tons,
or 5,355 tons less than that forwarded
the previous week. The total for the year
to date is 2,095,425 tons.

Holiday Work Adds to Supply

Secretary Ickes estimated that 1,534,000
tons of coal was added to the nation's sup-
ply by having miners forego the Labor
Day holiday. However, a bulletin from
the National Coal Association said bitumi-
nous production for the week ended Sept.
11 was off 500,000 tons because of the
Labor Day holiday, and said absenteeism
during the holiday period was high.

The National Coal Association revealed
that bituminous production from Jan. 1
through Sept. 11 was 1.8 percent higher
than last year's figures. An estimated
408,922,000 tons had been mined this
year against 401,510,000 last year.

A National ODT Solid Fuel Industry
Advisory Committee, consisting of twelve
representative solid fuel dealers, was ap-
pointed Sept. 21 by Joseph B. Eastman,
director of the Office of Defense Trans-
portation, to assist the ODT in forming
delivery-truck pools. Mr. Eastman said
that for purposes of good administration
district and local dealer committees will
assist district officials of the ODT in
carrying out the coal delivery program.
He added, however, that the members of
the national committee, who were nomi-
nated by the National War Council of
the Retail Solid Fuel Industry, will be
consulted by the ODT on problems of

manpower, equipment, spare parts for trucks, and other matters which approach the national level.

The national program announced by ODT on Sept. 2 aims at relief of the manpower shortage facing coal dealers throughout the nation and at methods of delivery which will permit dealers participating voluntarily in the program to pool their facilities, load up at one another's yards, or take other steps to obtain maximum delivery with the minimum of manpower, equipment and customer waiting.

Dealers named to serve on the national committee are: Irvin Davis, president, Hatfield-Campbell Creek Coal Co., Cincinnati, Ohio; Millard Bruner, J. M. Bruner & Co., Philadelphia, Pa.; E. W. Dobson, vice-president, J. F. Anderson Lumber Co., Minneapolis, Minn.; Fred Corray, president, Corray Brothers, Urbana, Ill.; Fred O. Finkbeiner, Denver, Colo.; Clifford L. Arntson, Portland, Ore.; F. William Bendick, J. H. Bendick Coal & Material Co., St. Louis, Mo.; Frank G. Reed, vice-president, Cramer Clinch Coal Co., Chicago; A. F. Duemler, Boston, Mass.; J. L. Newbold, vice-president, American Retail Coal Association, Washington, D. C.; Charles M. Farrar, executive vice-president, Southeastern Retail Coal Association, Atlanta, Ga.; and John Schreiber, Retail Solid Fuel Industry, New York City.

Dealers' committees will be formed in all 142 ODT motor transport districts and will work with the ODT officials in those areas to evolve plans for conservation and pooling of delivery services.

Mr. Ickes also announced that shipment of bituminous coal in carload lots from Districts 1 to 4 and 6 to 8 inclusive would be conditional on a written order or confirmation containing detailed information about the buyers' fuel stocks. Affected were sections of Pennsylvania, Maryland, West Virginia, Ohio, Kentucky, Virginia and Tennessee.

The order applied to all bituminous coal produced in the listed districts shipped in carload lots to all purchasers except commercial dock operators and retail dealers. Coal may be shipped on any order by any method only when the order contains this information:

The average number of days' supply of coal of the plant or railroad system for which the order to the producer or wholesaler is issued.

The current monthly consumption requirements of the plant or railroad system ordering the coal.

The total tonnage of bituminous coal ordered for the plant or railroad system from all other suppliers of bituminous coal to be delivered during the month during which the coal ordered is to be delivered.

District 8 was ordered by Secretary Ickes to reduce shipments to a large portion of its customers in order to divert special-purpose metallurgical coal and coal to the Great Lakes. Under the order, District 8 can ship no more than 75 percent of current monthly requirements to:

Purchasers buying for electrical generation use and having more than 60 days' supply on hand; railroads receiving coal by all-rail and having more than 30 days'



Fifth of six easy steps in Thermit welding of rail joints: Excess metal has been cut away and weld ground or filed to railhead finish after the weld has cooled and mold boxes and clamps have been removed. Previously, rails were aligned and clamped into position, sand mold was formed and mold box clamped to rails, rail ends preheated, crucible charged and poured.

1 FOREMAN + 6 WORKERS = 25 RAIL JOINTS THERMIT-WELDED A DAY

There are no secret tricks, no complicated steps in Thermit rail welding. In fact, one foreman and six workers can, after brief instruction by a Metal & Thermit supervisor, install 25 welds a day—welds that save vital material and manpower for other essential war needs.

Smooth, continuous stretches of Thermit-welded track eliminate pounding and power-losses at joints, reduce maintenance, and conserve thousands of pounds of metal ordinarily used for mechanical joints in new track construction. The life of both rails and rolling stock is lengthened. Of rail-steel quality, Thermit welds are formed with a minimum of internal stresses to produce a weld of unusual strength and durability that can withstand your heaviest loads. Send for the concise, informative, illustrated booklet, "Continuous Rail for Main Haulage Track."

Note: Anticipating your Thermit requirements as much in advance as possible, you will help us to meet your needs.

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Specialists in welding for nearly 40 years. Manufacturers of Murex Electrodes for arc welding and of Thermit for repair and fabrication of heavy parts.

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used since I was a boy!*



Genuine FLEXIPIPE...the Original Flexible Ventilating Tubing for Mines and Tunnels

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Genuine Flexipipe is practical, and economical, for almost any mine or tunnel operation. Made in three grades.

Mail the coupon today for descriptive literature on *Genuine Flexipipe*.

EASY TO HANDLE! *Genuine Flexipipe* is easy to carry. 1000 feet, with blower equipment, can be loaded in a single mine car.

EASY TO INSTALL! A thousand feet of *Genuine Flexipipe* has been installed in less than one hour.

FLEXIBLE INSTALLATION! *Genuine Flexipipe* can be threaded through narrow irregular passages without cutting ventilating efficiency.

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The Original Flexible Ventilating Tubing

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Please send literature on *Genuine Flexipipe*.

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Company _____
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City _____ State _____

supply on hand; railroads receiving coal by combined rail and tidewater and having more than 45 days' supply on hand; any other purchasers receiving coal by rail or by tidewater-rail or by river, having more than 30 days' supply on hand.

A production rate of 4,638,700 bbl. of petroleum liquids daily was set by Mr. Ickes for petroleum-producing states for October, representing an increase of 80,000 bbl. daily over September. An increase of 70,000 bbl. of East coast furnace oil stocks was reported for the week ended Sept. 11. It was the biggest increase in recent weeks in the drive to build up eastern stocks.

The Petroleum Administration for War announced Sept. 23 suspension, for the time being, of its program for the conversion of industrial and commercial oil-burning equipment to the use of coal. In making the announcement, Petroleum Administrator Harold L. Ickes said: "We are suspending the program in view of the uncertainties in the coal situation, including the shortage of delivery equipment and manpower for retail coal delivery."

The PAW announcement emphasized that the suspension of conversion activity does not apply to conversions now in process, inasmuch as the supply program for the coming winter has been based upon the assumption that requirements will be reduced by the amount now used in these facilities.

Reviewing the conversion campaign, Deputy Administrator Ralph K. Davies pointed out that industrial conversions to date have resulted in savings equivalent to 176,500 bbl. of fuel oil per day. Of this total, 137,155 bbl. daily have been saved in the 17 eastern states and the District of Columbia, 30,034 bbl. daily in the 15 middle western states, 3,566 bbl. daily in the southwestern-Gulf Coast states.

Deliveries of firewood and solid fuels to the States of Washington and Oregon and the ten northernmost counties in

Bureau of Mines Approvals

Five approvals of permissible equipment were issued by the U. S. Bureau of Mines in August, as follows:

Goodman Mfg. Co.—Type 712-CJ shortwall mining machine; 50-hp. motor, 250 volts, d.c.; Approval 484; Aug. 13.

Goodman Mfg. Co.—Type 1824-CJ cutting machine; two motors, 10 and 50 hp., 250 volts, d.c.; Approval 485; Aug. 19.

Goodman Mfg. Co.—Type 1224-CJ cutting machine; two motors, 35 and 50 hp., 250 volts, d.c.; Approval 469; Aug. 24.

Joy Mfg. Co.—Type 11BU8P loading machine; two motors, 4 and 50 hp., 250 and 500 volts, d.c.; Approvals 486 and 486A; Aug. 28.

Goodman Mfg. Co.—Type G-124 shaker conveyor; 10-hp. motor, 440 volts, a.c.; Approval 487A; Aug. 28.

Idaho were put on a preference basis by OPA under Ration Order 14-A, effective Sept. 20 and applying to dealers in that area. Under the terms of the order, dealers are defined; they must register and make monthly reports; must secure information as to the kinds and amount of fuel used by the consumer, etc.; and when all other conditions are met, may deliver to consumers in the following order of preference: (1) To fill needs for any purposes other than heat, domestic hot water or domestic cooking (restricted to annual inventory); (2) for heat, domestic hot water or domestic cooking where fuel on hand is less than one-quarter of the annual needs (limited to one-quarter annual inventory); (3) where fuel on hand is one-quarter or more but less than one-half annual needs (limited to one-half annual inventory); (4) where fuel on hand totals one-half or more of annual requirements (limited to annual inventory); (5) to consumers who use other fuels for their needs (limited to an amount necessary to make total inventory of all fuels to meet annual requirements). The order contains the single full-load exemption and contains the provision that it shall not limit the quantities of coal delivered to or for the account of any persons: (1) For industrial or agricultural purposes; (2) for the operation of transportation facilities; (3) in carload or more than carload lots (or truckload equivalent). Pyramiding of orders is prevented. This order was issued after SFAW had determined that limited distribution was necessary in this area and WPB had authorized OPA to take such step.

Business Men to Advise

The appointment of 38 leading business men in the coal industry to serve on advisory groups assisting in the development and administration of coal rationing activities was announced Sept. 27 by OPA. These men have been named to four committees representing the anthracite industry, the bituminous industry, the coal trade associations, and the coal equipment industry. In addition, representatives will be drawn from these committees to form a Coal Industry Advisory Council, which will be a steering body to consider over-all problems of coal rationing.

Announcing the formation of these business and industry groups, Chester Bowles, OPA general manager, said:

"In carrying out the request of the War Production Board to develop necessary plans for rationing coal, we called upon the coal industry for active help. Over the past several weeks we have consulted frequently with various advisory groups of the industry. These groups included producers, distributors and dealers. The advice and guidance of these experienced leaders of the industry has been of great help. We want to continue the relationship and make more effective use of it in every way we can.

"So far it has been necessary to put into effect only one coal-rationing program—Ration Order A-19. This is the recently announced plan to limit purchases of anthracite by consumers. The plan involves only twelve Northeastern states and the

District of Columbia. This program was authorized by WPB after SFA had determined that a limitation on distribution was necessary from September through November, 1943.

"Naturally, we in the OPA want to have as few rationing programs as possible. In the case of coal, we are hopeful that it will not be necessary to extend rationing to more formal controls. On the other hand, we must be prepared in the event that authority to ration is delegated to OPA by WPB and in the event that SFA determines that rationing is necessary."

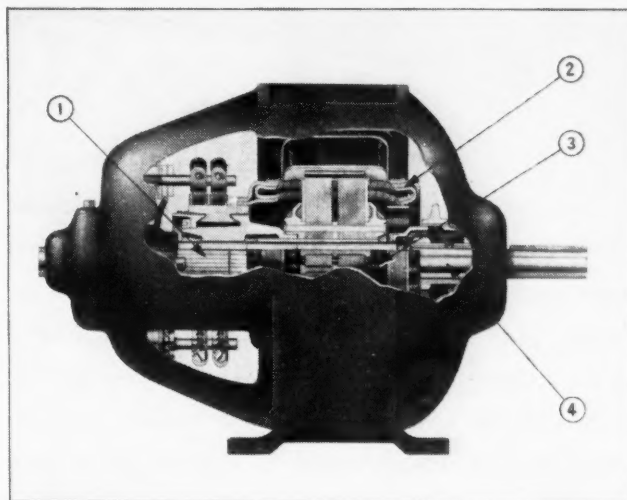
The new coal advisory committees and the advisory council will function similarly to those established in the early stages of

developing and operating rationing programs for fuel oil and stoves. Members will be called upon for consultation whenever problems arise, and frequent meetings for full discussion of rationing activities will be held with officials of OPA's Fuel Rationing Division.

Committee and council members have accepted appointments as follows:

Coal Industry Advisory Council—W. F. Bayfield, American Coal Sales Association, Washington, D. C.; Merrill F. Blankin, American Society of Heating and Ventilating Engineers, New York City; Roch P. Botsch, United Coal & Dock Co., Milwaukee, Wis.; E. M. Douthat, Sinclair Coal Co., Kansas City, Mo.; A. F. Duem-

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Anthracite Industry Advisory Committee—Robert Birtley, Hammon Coal Co., Girardville, Pa.; Gordon C. Cooke, Delaware, Lackawanna & Western Coal Co., New York City; Richard Darlington, Pennsylvania & Hudson Co., Philadelphia, Pa.; A. F. Duemler, Batchelder-Whittemore Coal Co., Boston, Mass.; Roger B. Jones, Donaghy & Sons, Philadelphia, Pa.; J. Everett Robbie, Quincy Coal & Fuel Oil Co., Quincy, Mass.; A. E. Sloat, Lehigh Valley Coal Sales Co., New York City; Roderick Stephens, Stephens Fuel Co., Inc., New York City; C. W. Stone, Susquehanna Collieries, Philadelphia, Pa.

Bituminous Industry Advisory Committee—Roch P. Botsch, Unitel Coal & Dock Co., Milwaukee, Wis.; James E. Colliflower, James E. Colliflower Co., Washington, D. C.; Paul E. Conrades, Merchants Ice & Coal Co., St. Louis, Mo.; Fred Corray, Corray Brothers, Urbana, Ill.; Henry T. DeBardeleben, DeBardeleben Coal Corp., Birmingham, Ala.; E. M. Douthat, Sinclair Coal Co., Kansas City, Mo.; Harold D. Everett, Smokeless Fuel Co., Charleston, W. Va.; Fred J. Howden, Howden Coal & Oil Co., Savannah, Ga.; J. R. Maust, Maust Coal & Coke Co., New York City; Walter B. Muckerman, City Ice & Fuel Co., Chicago; Charles O'Neill, United Eastern Coal Sales Corp., New York City; Charles J. Reardon, Metropolitan Coal Co., Boston, Mass.; Frank G. Reed, Cramer Clinch Coal Co., Chicago; H. C. Rodgers, Hickman, Williams & Co., Cincinnati, Ohio; Paul Schenuemann, Peavey Elevators, Minneapolis, Minn.; Frank V. Thompson, C. H. Sprague & Son Co., Boston, Mass.; R. P. Tibolt, New England Coke Co., Boston, Mass.; C. Claffin Young, Claffin Somers Coal Co., Worcester, Mass.

Coal Trade Association Advisory Committee—W. W. Bayfield, American Coal Sales Association, Washington, D. C.; Charles M. Farrar, Southeastern Retail Coal Assn., Inc., Atlanta, Ga.; James L. Newbold, American Retail Coal Association, Washington, D. C.; Edgar Patton, Denver Coal Merchants Association, Denver, Colo.; John Schreiber, Office of the Coordinator of the Retail Solid Industry of the City of New York; Hugh C. Thompkins, Fuel Merchants Association, New Jersey, Newark, N. J.

Coal Equipment Advisory Committee—Merrill F. Blankin, American Society of Heating and Ventilating Engineers, New York City; Dr. L. D. Bristol, health director, American Telephone & Telegraph Co., New York City; R. E. Ferry, general manager, Institute of Boiler & Radiator Manufacturers, New York City.

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Joseph C. Fitts, secretary, Heating, Piping and Air Conditioning Contractors National Association, New York City; Ernest L. Flentje, executive secretary, National Association of Master Plumbers, Washington, D. C.

Increased fuel conservation and improved heating comfort for war workers through greater efficiency in the operation of heating equipment next winter are expected to result from studies recently completed by heating engineers from private industry at war housing projects in various sections of the country, it was announced Sept. 27 by the Federal Public Housing Authority. The findings and recommendations resulting from the studies are set forth in a "Heating Correction Guide" now being distributed by FPHA to war housing project managers and tenants. The guide contains common causes leading to unsatisfactory heating conditions and recommends solutions. Four types of heating equipment are covered: (1) forced warm-air (project-operated) non-circulating systems; (2) forced warm-air (project-operated) recirculating systems; (3) forced warm-air (tenant-operated); and (4) individual space heaters.

Greenland Coal Corp. to Open New Strip Operation

Greenland Coal Corp., Wheeling, W. Va., has begun preliminary work on a new strip mine at Duo, Greenbrier County, W. Va., on the Nicholas, Fayette & Greenbrier R.R. Production is to start early in October, with a daily output of 700 tons the ultimate objective. William Fry, who has been active in strip mining for many years in Ohio, is superintendent of the new operation.

National War Fund Launches Huge Charity Drive

National War Fund, a federation of war philanthropies, has launched the largest federated charity drive of all time. Starting Oct. 1, with a goal of \$125,000,000, the drive is to run until Dec. 1. Its aim, as stated by the Fund, is "support for the far-flung U.S.O.—the home away from home for our own fighting men; comforts for the 'barbed-wire legion' of prisoners of war; food for starving Greece; medical supplies for gallant Russia; aid for the scorched earth of stricken China; assistance for hundreds of thousands of homeless refugees."

To carry out its aims, having the one objective—to help win the war sooner, with a minimum loss of life—the Fund has selected these 17 agencies as members having the requisite leadership, experience and facilities: U.S.O., United Seamen's Service, War Prisoners' Aid, Russian War Relief, United China Relief, British War Relief Society, Greek War Relief Association, Polish War Relief, United Yugoslav Relief Fund, French Relief Fund, Belgian War Relief Society, United Czechoslovak Relief, Queen Wilhelmina Fund, Norwegian Relief, Friends of Luxembourg, Refugee Relief Trustees and U. S. Committee for the Care of European Children.

Anthracite Firms Go to Court For Lower Assessments

Glen Alden, Lehigh Valley and Lehigh & Wilkes-Barre coal companies, large anthracite producers, have inaugurated separate actions in filing court appeals from the triennial assessment by Assessors Adrian Jones and Ben Rhys, Luzerne County, Pennsylvania (see *Coal Age*, August, p. 149, and September, p. 135). Court action was entered by the three companies Sept. 10.

Glen Alden filed appeals from assessments on its holdings in Ashley Borough, Courtdale Borough, Edwardsville Borough, Hanover Township, Kingston Borough,

Hazle Township, Larksville, Laurel Run Borough, Nanticoke City, Newport Township, Plymouth Township, Sugar Notch, Warrior Run Borough, Wilkes-Barre City and Wilkes-Barre Township.

Lehigh Valley filed appeals from assessments on its properties in Wyoming Borough, West Pittston, Wilkes-Barre Township, West Wyoming, Wilkes-Barre City, Swoyerville, Plains Township, Pittston City, Laurel Run Borough, Kingston Borough, Kingston Township, Hanover Township, Forty Fort, Exeter and Duryea.

Lehigh & Wilkes-Barre filed appeals from imposts on its holdings in Hanover Township, Plymouth Borough, Plymouth Township and Wilkes-Barre City.

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5-Year Research at Battelle Approved by B.C.R.

With the goal of greater public benefits from the use of bituminous coal, such as fully automatic home heating and summer cooling, smokeless stoves, gas from coal for the nation's pipelines, radically improved railroad locomotives and chemical products, H. N. Eavenson, president, Bituminous Coal Research, Inc., announced approval Sept. 18 by that agency's board of directors of a new five-year \$2,500,000 research program. Bituminous Coal Research, Inc., the research organization of the bituminous coal industry, is affiliated with the National Coal Association and has laboratory headquarters at Battelle Memorial Institute, Columbus, Ohio.

Twelve major research investigations involving over 90 specific topics and affecting the consumption of virtually the entire annual bituminous coal production are contemplated. The half-million-dollar-a-year undertaking aims to rid the skies of coal smoke through complete combustion in apparatus ranging from small smokeless cabin heaters to large industrial furnaces.

Cooling of residences in the summer by the same coal furnace that heats it in the winter, conversion of coal into gas without byproducts, and household stokers that automatically take coal from the bin and put the ashes into containers are among the leading subjects scheduled for investigation. Coal-fired railroad locomotives which operate over longer distances without stops for fuel and water will be possible through improved combustion in radically new designs.

Coal-burning heaters and ranges that heat steadily all day and night without smoke and with only infrequent attention and one rekindling a season are to be perfected. Chimney construction will be given attention to help eliminate faulty designs.

"Fluid coal," a suspension of finely pulverized coal that burns like gas in a hot furnace, is slated for further tests to enable coal to replace oil and gas in the furnaces of war factories where steel is now heated for forging and rolling. While finely pulverized coal has also been burned experimentally inside special "orange-hot" alloy steel tubes, the commercial development of this high-temperature heating element for heat-treating furnaces will be undertaken as part of the new program.

To Study Many Uses

The research also includes experimentation with pulverized-coal-fired internal combustion engines and gas turbines to produce power and propel locomotives and ships. An investigation of coal as an ingredient in brick manufacture, synthetic rubber production and in agriculture also will be undertaken. Ashes will be given a major share of attention in proposed studies of burning coal in industrial boiler furnaces.

The main objective of a project on the production of chemicals from coal is to obtain an ash-free liquid, probably by hydrogenation, which then could be processed by subsequent treatment to yield a variety of materials for various industries.

The board of directors, who approved the two-and-a-half-million-dollar program, is composed of J. E. Butler, president, Stearns Coal & Lumber Co., Stearns, Ky.; E. H. Davis, executive vice-president, New York Coal Co., Columbus, Ohio; Irvin Davis, president, Hatfield Campbell Creek Coal Co., Cincinnati, Ohio; H. N. Eavenson, president, Clover Splint Coal Co., Pittsburgh, Pa.; B. R. Gebhart, vice-president, Chicago, Wilmington & Franklin Coal Co., Chicago; H. A. Glover, vice-president, Island Creek Coal Sales Co., Huntington, W. Va.; C. J. Potter, vice-president, Rochester & Pittsburgh Coal Co., Indiana, Pa.; W. C. Hull, vice-president, Chesapeake & Ohio Ry., Cleveland, Ohio; R. E. Jamison, vice-president, Jamison Coal & Coke Co., Greensburg, Pa.; J. B. Morrow, president, Pittsburgh Coal Co., Pittsburgh, Pa.; S. S. Nicholls, vice-president, C. H. Sprague & Sons, Boston, Mass.; D. H. Pape, president, Sheridan-Wyoming Coal Co., Monarch, Wyo.; R. H. Sherwood, president, Central Indiana Coal Co., Indianapolis, Ind., and K. A. Spencer, vice-president, Pittsburgh & Midway Coal Mining Co., Kansas City, Mo.

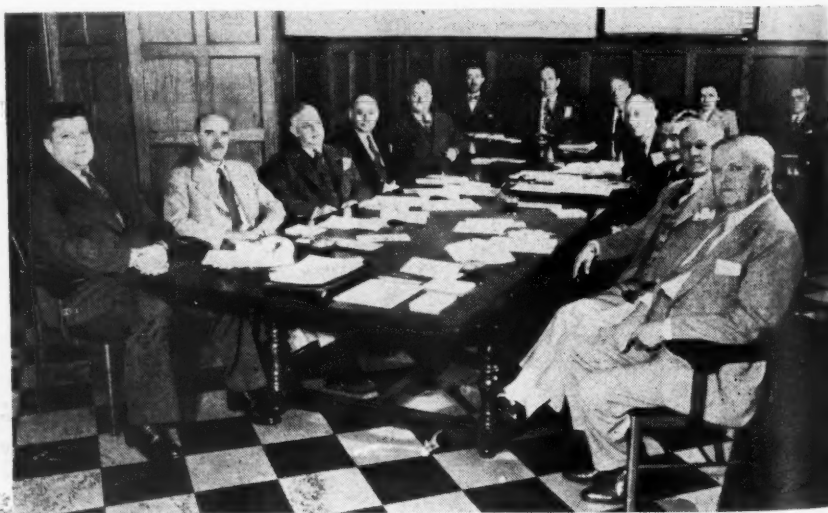
Members of the technical advisory board are: Paul Barkman, Cleveland Cliffs Iron Co., Cleveland, Ohio; C. B. Baton, Baton Coal Co., Pittsburgh, Pa.; E. D. Benton, Louisville & Nashville R. R., Louisville, Ky.; F. H. Bird, Binkley Coal Co., Chicago; Minott Brooke, Chesapeake & Ohio Ry., Huntington, W. Va.; T. C. Chesley, Sinclair Coal Co., Kansas City, Mo.; J. D. Doherty, Koppers Co., Pittsburgh, Pa.; Homer M. Faust, New York Coal Sales Co., Columbus, Ohio; Carroll F. Hardy, Appalachian Coals, Inc., Cincinnati, Ohio; Henry F. Hebley, Pittsburgh Coal Co., Pittsburgh, Pa.; Howard A. Herder, Sahara Coal Co., Chicago; E. J. Kerr, Island Creek Coal Sales Co., Huntington, W. Va.; V. G. Leach, Peabody Coal Co., Chi-

cago; E. C. Payne, Consolidation Coal Co., New York City; C. J. Potter, Rochester & Pittsburgh Coal Co., Indiana, Pa.; F. K. Prosser, Norfolk & Western Ry., Roanoke, Va.; E. S. Pugh, Raleigh Smokeless Coal Co., Beckley, W. Va.; Carl Scholz, Carbon Fuel Co., Charleston, W. Va.; John Scott, New River Co., Mt. Hope, W. Va.; L. A. Shipman, Southern Coal & Coke Co., Knoxville, Tenn.; R. F. Stilwell, Red Jacket Coal Sales Co., Columbus, Ohio; R. L. Sutherland, Traux-Traer Coal Co., Minneapolis, Minn.; J. C. R. Taylor, Virginian Ry., Norfolk, Va.; J. E. Tobey, Upper Monongahela Valley Association, New York City; Max A. Tuttle, Knox Consolidated Coal Corp., Indianapolis, Ind.; R. B. Williamson, Eastern Coal Sales Co., Bluefield, W. Va.; and C. A. Reed, National Coal Association, Washington, D. C.

Joint Fuels Conference To Cover Four Sessions

Interesting and important papers and discussions are scheduled for the four sessions—morning and afternoon each day—of the joint fuels conference of the Coal Division, American Institute of Mining and Metallurgical Engineers, and the Fuels Division, American Society of Mechanical Engineers, Oct. 28 and 29, at the William Penn Hotel, Pittsburgh, Pa. At the first session, on coal research, Julian E. Tobey, Upper Monongahela Valley Association, will be chairman, and Sumner B. Ely, co-chairman, with these papers: "Progress in Coal Utilization," E. R. Kaiser, Battelle Memorial Institute; "Test Methods for Rating the Performance of Domestic Stoker Coals," R. Helfinstine, Illinois Geological Survey; and panel discussion on "Selling Coal Research and Its Product," led by Mr. Tobey.

At the second session, on mining man-



Directors of Bituminous Coal Research, Inc., who met at Battelle to consider new research program to increase the use of coal, included, left to right: C. J. Potter, Rochester & Pittsburgh Coal Co.; Ralph E. Jamison, Jamison Coal & Coke Co.; E. H. Davis, New York Coal Sales Co.; H. F. Hebley, Pittsburgh Coal Co.; Clyde E. Williams, Battelle Memorial Institute; E. R. Kaiser, Battelle; J. E. Tobey, Upper Monongahela Valley Association; H. N. Eavenson, B.C.R. president, Clover Splint Coal Co.; J. Leppert, Battelle; R. A. Sherman, Battelle; C. A. Reed, National Coal Association; E. J. Dillon, C. H. Sprague & Sons; W. C. Hull, Chesapeake & Ohio Ry.; R. H. Sherwood, Central Indiana Coal Co.

agement, with D. L. McElroy as chairman and A. R. Mumford, co-chairman, these papers will be read: "Modern Training for the Miners at the Face," G. R. Spindler, West Virginia University, and "Coal Faces Post-War Adjustment," R. M. Weidenhammer, Cosgrove Coal Co.

Gas and carbonization will be the subject of the third session, with H. H. Lowry as chairman, Martin Mayers as co-chairman and these papers: "Utilization of Producer Gas in Industrial Furnaces," D. B. Hendryx, Harbison-Walker Co., and "Sources of Pressure Occurring During the Carbonization of Coal," G. C. Soth and C. C. Russell, Koppers Co.

The final session, on war program, will have as chairman W. G. Christy and as co-chairman J. D. Doherty, with these papers: "Laboratory and Field Tests on Coal-in-Oil Fuels," J. F. Barkley, U. S. Bureau of Mines; A. B. Hersberger, Atlantic Refining Co., and L. R. Burdick, U. S. Bureau of Mines; and panel discussion on "Trends in Fuels."

H. F. Hebly, Pittsburgh Coal Co., will speak on "Australia" at the luncheon on the opening day. At the banquet, on the second day, T. E. Purcell will be toastmaster and Gen. E. P. Sorensen, Assistant Chief, Army Air Force, will speak on "Application of Air Power." At the same time the Percy Nicholls award will be presented to Henry Kreisinger, Combustion Engineering Co.

New Quota Application Forms Sent Out by Mining Division

Application forms for first-quarter-1944 quotas for maintenance, repair and operating supplies were sent out by the Mining Division, War Production Board, in mid-September, and the completed forms are to be returned not later than Oct. 20. The forms—WPB-2937, 2938, 2939 and 2940 (formerly PD-400 for mines and PD-760 for smelters)—are duplicates of the fourth-quarter applications, with three minor exceptions, and the accompanying instructions are substantially as heretofore.

"Inventory" now applies only to new material. Other inventory is reported under "Remarks" or separately.

Requirements of bare copper wire are again to be reported by weight of each size and type, and a line has been added to the form for reporting the total weight for all sizes. Insulated copper wire is to be listed separately by number of conductors, size and type, in terms of footage, and a line has been added to carry the total copper content of all the insulated wire. Where an accurate calculation of the total copper content of insulated wire is feasible, the figures should be entered in the respective columns. Where such calculation is not feasible, this line should be left blank for filling in by the Mining Division.

The third change in the forms is in the listing of "rubber belting," which has been qualified by the addition of "(conveyor only)" to define clearly this item and indicate that other such belting comes under the dollar value quota for operating supplies.

Quotas requested should include all



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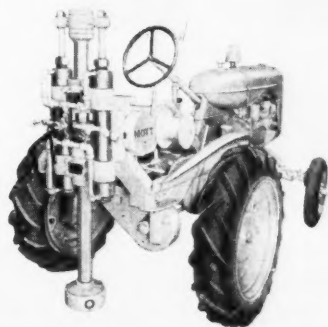
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those materials for which orders are to be placed in the first quarter for anticipated delivery in that quarter, plus materials ordered in previous quarters and charged against advance authorizations for the first quarter. It is explained that orders for other than controlled materials, placed for delivery in the fourth quarter of 1943 and charged against the fourth-quarter quota, need not be deducted from the first-quarter quota even if delivery is not made until that quarter. No such carry-over is permitted, of course, with controlled-material orders.

Applications for new equipment will continue to be made on Form WPB-2910, the new standardized form which is now

compulsory for all mines and smelters.

At a meeting of the Mining Machinery Manufacturers' Advisory Committee on Sept. 20 with Director A. S. Knoizen of the Mining Division and other WPB officials, it was estimated that to meet domestic and foreign coal requirements the United States will be required to produce 620,000,000 tons of bituminous and from 65,000,000 to 68,000,000 tons of anthracite in 1944. To offset manpower losses at the mines during the past year, and any future losses, it was pointed out that certain quantities of new mining equipment must be produced and adequate supplies of repair parts must be made available. To meet these demands, manufacturers will

be called upon to produce about \$75,000,000 worth of mining machinery between now and the end of 1944, including about \$37,000,000 in new equipment and \$26,000,000 in repair parts, plus the present backlog.

Existing facilities are adequate for the production of the equipment required by this program provided the necessary materials and components are made available to the manufacturers, it is reported. These critical components include such items as bearings, gears, castings, forgings, electrical equipment, marine hardware, various types of cables, and various rubber products.

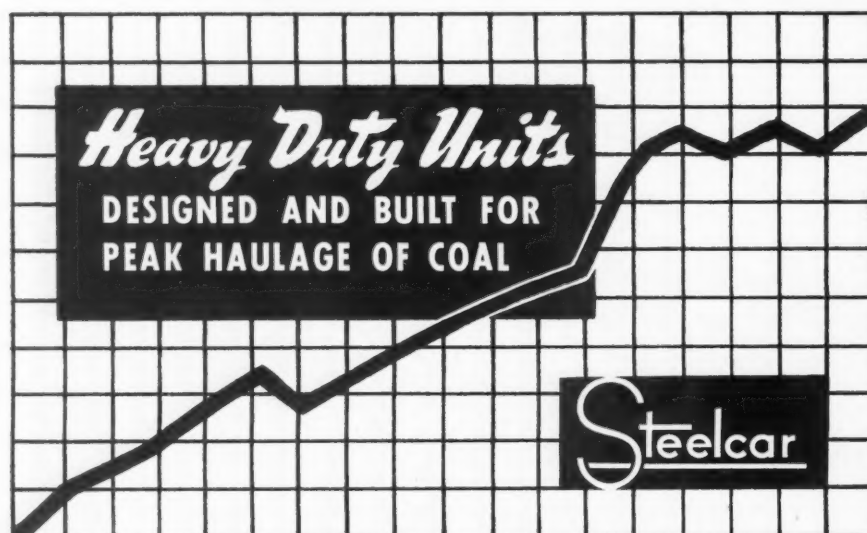
Specific ceiling price coverage for all primary forest products produced in the United States is now provided by the Sept. 21 revision of Maximum Price Regulation No. 216 (Eastern Primary Forest Products), together with the previously issued MPR No. 284 (Western Primary Forest Products). Maximum prices for Eastern wooden mine material, previously covered by MPR 218, have been transferred to MPR-216. In addition, new ceiling prices are established by MPR-216 for wooden mine materials produced in Kentucky, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas south of the Arkansas River, Kansas, Nebraska, Iowa, Minnesota, Michigan and all New England States. These new ceilings reflect the normal differentials and relationship which previously existed between mine material produced in these States and those for which price ceilings were already established.

Delivery Addition Prescribed

In a change in transportation provisions, Maximum Price Regulation No. 216 now provides a delivery addition according to weight and haul, which must be shown separately on invoices when shipment is made to the user by motor truck owned or controlled by the seller. Previously the maximum transportation charge for shipment by private motor truck was the rail freight rates from loading-out point to destination.

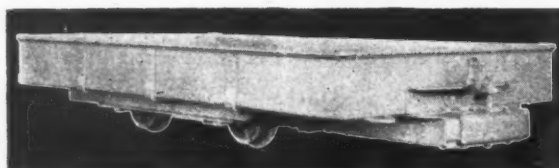
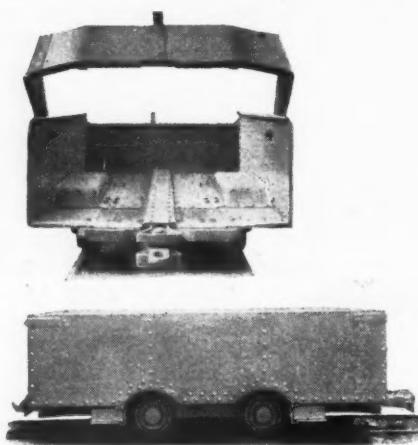
Restrictions on the use of certain critical materials in the manufacture of safety equipment have been eased by the Sept. 20 amendment of Limitation Order L-114. Nickel plating for spectacle-type goggles and slip-overs for industrial spectacles was previously permitted only up to Nov. 30, 1943, with the expectation that a suitable substitute would be developed, but this expiration date is now deleted. Aluminum may now be used in specified parts of gas masks, oxygen breathing apparatus, respirators and goggles where less scarce materials are not practicable, and the use of magnesium in place of aluminum is required wherever practicable. Aluminum for machine guards is to be secured through application to WPB's Safety and Technical Equipment Division. The use of copper-wire side screws on safety goggles is now permitted, and the copper-base alloy, nickel silver and nickel plating are authorized for certain uses in the manufacture of spectacle-type goggles.

L. C. Whittaker, former distribution officer of WPB Mining Division, has been



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appointed assistant staff director. The division now has two assistant directors, the other being Dr. F. Stuart Miller, with the title of assistant director for operations. Mr. Whittaker now serves as liaison between the Mining Division and other WPB divisions as well as various other governmental agencies. Dr. Miller continues in charge of quotas, allotments and internal working procedures of the division. It also has been announced that Lane W. Hildreth has resigned as chief of the Mining Machinery Section of the Mining Division. He has been succeeded by Leslie M. Case, former deputy chief of the Mining Machinery Section, who was with the Worthington Pump & Machinery Corp. before joining the division. John E. M. Wilson was appointed technical adviser of the Mining Machinery Section, effective Sept. 13. Mr. Wilson, who is Pittsburgh (Pa.) district manager for the Jeffrey Mfg. Co., has been lent by his company on a dollar-a-year basis.

Personal Notes

EMIL BRANSBURG, formerly assistant foreman at Somers mine of the Pittsburgh Coal Co., Pricedale, Pa., has been made general assistant there.

SAM DAVIS, heretofore production assistant at Montour No. 4 mine of the Pittsburgh Coal Co., Lawrence, Pa., has been named assistant to the production engineer.

MAX H. FORESTER, general manager of the Consolidation Coal Co. since 1941, has been elected vice president in charge of operations of the western division with headquarters in Jenkins, Ky. He succeeds the late J. D. Snyder. A graduate of Yale University, Mr. Forester has been connected with the company since 1912.

GEORGE GEARING, hitherto fireboss at Somers mine of the Pittsburgh Coal Co., Pricedale, Pa., has been promoted to assistant foreman.

WILLIAM J. GRIMES, outside foreman at Gravity Slope colliery of the Hudson Coal Co., Archbald, Pa., has retired on a pension after 51 years of service with the company.

GEORGE R. HIGINBOTHAM, manager of the Pennsylvania division, Consolidation Coal Co., has been appointed as assistant to Vice President W. L. Doolittle.

S. K. HISSOM, superintendent at Banning No. 1 mine of the Pittsburgh Coal Co., Van Meter, Pa., has also been made superintendent of Banning No. 2 mine, Whitsett, Pa.

NATHANIEL KIRK, who has been combination mine foreman and superintendent at Banning No. 2 mine of the Pittsburgh Coal Co., Whitsett, Pa., has been transferred to Lindley mine, Houston, Pa., as mine foreman.

GUS LAMBERT, for years associated with the Hudson Coal Co. and in recent years superintendent of that company's Loree colliery, Plymouth, Pa., has been ap-

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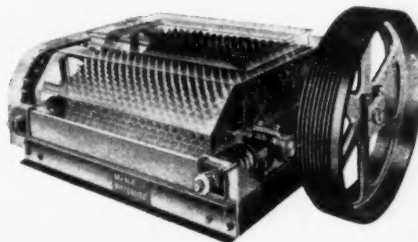
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pointed general manager of operations of the Jermyn-Green Coal Co., Pittston, Pa. This position was created after the acquisition of the Volpe properties. THOMAS BEANEY, who has been on the staff of engineers of Jermyn-Green, has been appointed superintendent of what formerly was Volpe's No. 6 colliery.

J. M. MacLACHLAN, formerly plant chemist at Champion No. 1 cleaning plant of the Pittsburgh Coal Co., has been appointed assistant to D. H. Davis, production control manager. Mr. Davis' place at Champion No. 1 has been taken by NICHOLAS MITTICA, technical trainee.

NICK MITTICA, technical trainee, has been appointed chief chemist at Champion No. 1 preparation plant of the Pittsburgh Coal Co., Champion, Pa.

HERBERT MOLLARD, formerly assistant foreman at Banning No. 2 mine of the Pittsburgh Coal Co., Whittsett, Pa., has been made mine foreman, vice Nathaniel Kirk, transferred.

JOSEPH PATNESKY, assistant foreman at Montour No. 4 mine of the Pittsburgh Coal Co., Lawrence, Pa., has been transferred to Henderson mine, Hendersonville, Pa., in the same capacity.

J. H. REPPERT, former head of OPA Bituminous Mine Price Section, has been appointed associate price executive of the Solid Fuels Branch of OPA. JOSEPH S. DUNN, formerly with the Bituminous Coal Division, has been made chief of the

newly created Mine Operations Section of OPA. JOHN W. McBRIDE, also formerly with the Bituminous Coal Division, is head of OPA's new Mine Statistics Section. These additions were made to take care of work thrown to the Solid Fuels Branch by the passing of the Bituminous Coal Act.

GEORGE A. ROOS, general manager, Philadelphia & Reading Coal & Iron Co., Pottsville, Pa., recently elected to the Anthracite Board of Conciliation to succeed JOHN R. SHARP, resigned, has been elected president of the board.

MIKE SAMONCHECK, fireboss at Somers mine of the Pittsburgh Coal Co., Pricedale, Pa., has been made assistant foreman.

WILLIAM SIMS, night foreman at Montour No. 4 mine of the Pittsburgh Coal Co., Lawrence, Pa., has been made production foreman at that operation.

JOHN T. SYDNOR resigned Sept. 2 as vice president in charge of operations of the West Virginia Coal & Coke Corp. and will move from Omar, W. Va., to Huntington. He is to be succeeded by T. R. WORKMAN, formerly executive assistant to Mr. Sydnor, while H. W. BAUER will move into Mr. Workman's former post.

GEORGE O. TARLETON, manager of the Maryland division, Consolidation Coal Co., has been made head of the combined Pennsylvania-Maryland division and has moved his headquarters from Frostburg, Md., to Somerset, Pa.

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HOWARD J. THOMAS has resigned as general superintendent of mines for the Consolidated Coal Co., which operates the Bankhead Nos. 1 and 2 mines, at Bankhead, Ala., and the Summit mine of the coal division of the Southern Cotton Oil Co., New Orleans, also in the Walker County field.

RUSSELL V. TOWER, formerly sales manager of the Cumberland Coal Co., Baltimore, Md., has been elected vice president.

NICK TREMBACH, fireboss at Somers mine of the Pittsburgh Coal Co., Price-dale, Pa., has been advanced to assistant foreman.

FRED WIMER, lampman at Henderson mine of the Pittsburgh Coal Co., Hendersonville, Pa., has been named outside foreman.

14 Killed and 9 Injured In Anthracite Blast

Fourteen miners were killed and nine injured, one seriously, in a gas explosion Sept. 24, on the fifth level of the Moffat-Schrader coal mine, Lytle, Pa. The source of the ignition was not immediately determined.

Producing and Selling Costs For Bituminous Shown

Preliminary compilations of producing, administrative and selling costs for the nation's bituminous coal mines for the three months January through March, 1943, were released Aug. 31 by the U. S. Department of the Interior. These costs, which cover all mines with rail or river connections and those with a daily capacity of 50 tons or more, are shown in the following table, together with costs for the calendar years 1942, 1941 and 1940 in strictly comparable form.

	1943 Jan.- March	1942 Calendar Year	1941 Calendar Year	1940 Calendar Year
Dist. 1—Eastern Pennsylvania.....	\$2 6420	\$2 4982	\$2 3281	\$2 1487
Dist. 2—Western Pennsylvania.....	2 5454	2 3872	2 2223	1 9800
Dist. 3—Northern West Virginia.....	2 1208	2 0272	1 9152	1 6581
Dist. 4—Ohio.....	2 1503	2 0116	1 8846	1 6996
Dist. 5—Michigan.....	4 3680	4 3805	3 9682	3 9022
Dist. 6—Panhandle.....	2 2172	2 0827	1 9699	1 6377
Dist. 7—Southern Numbered 1.....	2 7358	2 6233	2 3807	2 0386
Dist. 8—Southern Numbered 2.....	2 4843	2 3644	2 1965	1 9058
Total, Price Area 1.....	\$2 4954	\$2 3678	\$2 2017	\$1 9426
Dist. 9—West Kentucky.....	1 5797	1 5841	1 5102	1 4174
Dist. 10—Illinois.....	1 7403	1 7228	1 6740	1 5859
Dist. 11—Indiana.....	1 6649	1 5845	1 5017	1 4336
Dist. 12—Iowa.....	2 7148	2 8130	2 7238	2 4558
Total, Price Area 2.....	\$1 7302	\$1 6999	\$1 6382	\$1 5616
Dist. 13—Southeastern (Area 3).....	3 0412	2 9794	2 7410	2 3148
Dist. 14—Arkansas-Oklahoma (Area 4).....	3 7453	3 7299	3 5573	3 3043
Dist. 15—Southwestern (Area 5).....	2 0552	2 0918	1 9415	1 8569
Dist. 16—Northern Colorado.....	2 5173	2 5508	2 4781	2 3677
Dist. 17—Southern Colorado.....	2 8849	2 8472	2 7567	2 5212
Dist. 18—New Mexico.....	3 7261	3 6286	3 4339	3 3679
Total, Price Area 6.....	\$2 8224	\$2 8146	\$2 7262	\$2 5281
Dist. 19—Wyoming.....	2 0355	2 0295	1 9149	1 8170
Dist. 20—Utah.....	2 4547	2 2592	2 1283	2 0138
Total, Price Area 7.....	\$2 1953	\$2 1209	\$1 9941	\$1 8898
Dist. 22—Montana (Area 9).....	1 3066	1 4253	1 3015	1 3049
Dist. 23—Washington-Alaska (Area 10).....	4 2137	3 9186	3 4933	3 0703
Total, United States.....	\$2 3517	\$2 2966	\$2 1207	\$1 9019

Canadians Urged to Make Most Of Available Coal

Backed by government regulations, the National Coal Conservation Committee is trying to meet a 20-percent coal shortage in Canada by an energetic program that will help Canadians to make the most of the fuel available to them. The campaign will extend into factories, homes and public buildings and will point out the advantages of such heat-saving methods as insulating and using storm windows. A study of Canadian coal consumption reveals that there is a waste equal to the 20 percent reduction the consumers are being asked to make.

Speaking before the Commercial Club at Halifax, Nova Scotia, Sept. 18, Dr. Alan E. Cameron, Deputy Minister of Mines, said that the byproducts of coal rather than coal mining can be made the means of expanded employment.

If there is a black market in the coal business, consumers have only themselves to blame because it is they who encourage such practices, Councillor Rodolphe Corbeil, chairman of the coal dealers' section of the Province of Quebec Retail Merchants' Association, said Sept. 4 commenting upon the Montreal situation. If there is some delay in coal deliveries, said Mr. Corbeil, it is simply because coal retailers cannot deliver in two or three months the amount of fuel which they usually deliver in nine or ten months.

The Ontario Municipal Association has passed a resolution calling on the provincial government to develop Ontario's peat bogs and lignite deposits immediately as a public utility, in order to offset fuel shortages and protect Ontario fuel users against the labor troubles in the United States which create recurring shortages. The resolution declared that this development would lower fuel cost in Ontario.

The latest data available on coal production and supplies reveal no definite

improvement in the general domestic picture, which is one of reduced supplies against increased requirements. Employment returns show a continued decline in the number of men engaged in coal mining, the figure as of July 1, 24,389, comparing with 24,429 at the beginning of June, 24,890 at the beginning of May, 25,653 at the beginning of March, 25,706 at the beginning of January, 25,655 at the beginning of July a year ago. In the total employed there was a drop from a year ago of 5 percent while tonnage produced fell 9 percent.

In the first seven months of the current year, Canada's coal mines produced 10,259,354 tons of anthracite, bituminous and sub-bituminous and lignite, which represents a reduction of 706,551 tons, or 6 percent, from output in the similar period a year ago. It was above production of 9,646,043 tons in the first seven months of 1941 and also 1940's total of 9,517,695 tons. The Nova Scotian fields were responsible for the decline, turning out 3,634,935 tons as compared with 4,436,531 tons a year ago.

Imports From U. S. Higher

In the same period Canada's imports of coal from the United States totaled 13,011,006 tons, an increase of 474,486 tons, or 4 percent, over a year ago and a rise of 4,343,312 tons, or 50 percent over this tonnage imported in the first seven months of 1941. Apparent supply of coal in Canada during the first seven months of the year of 22,707,858 tons, is a reduction of 442,528 tons, or 2 percent, from the supply in the same period a year ago, but is well above the 1941 supply of 18,054,875. Since there has been an increase in war industry, demand has risen well above the levels of that year and other fuels have become increasingly scarce.

All four Acadia Coal Co. mines, Stelarton, N. S., were back in production Sept. 1 as some 1,250 miners returned to their jobs after a strike that tied up the pits for a week. The miners staged the strike in protest against a four-weeks' levy of 50c. weekly for the *Gazette*, daily newspaper published in Glace Bay, N. S., by U.M.W., District 26. Loss of production during the tie-up was estimated at 1,300 tons daily.

A wage increase of 20 percent for employees of the Rothwell (N. B.) coal mines was approved Sept. 25 by the National War Labor Board on application of the Rothwell Mine Workers Union (A. F. L.). The mine employs about 100 men. The union, represented by H. S. Branscombe, an executive member, asked for a 20 percent raise to bring the wage levels in line with those paid in Nova Scotia mines. Miners at the Rothwell mine, in the Minto field, were being paid \$1.70 a ton with a bonus of 10 to 30c. an hour for difficult working conditions and a cost-of-living bonus of 59c. a day. Justice C. P. McTague, chairman of the board, in rendering the decision said that because it would be necessary for the company to make arrangements with the coal controller for meeting higher wage rates the increase could not be made retroactive but would be effective as from Sept. 20, the most recent payroll period.

The National War Labor Board has announced that it has approved pay increases ranging from 6 to 57c. a day in the basic wages paid in a number of Alberta and British Columbia coal fields, and also a number of increases in contract rates in the same area. "All increases should be retroactive to May 16, 1943, the board said in an official statement. "The question of ability to pay is of importance and also we think that uniformity in retroactivity is desirable." Pay changes include the Princeton (B. C.) district, where the rate of \$5.51 per day will be increased to \$5.78 per day, the rate now in effect at one of the mines on Vancouver Island.

Ask Pennsylvania Towns' Aid In Stream Pollution Problem

Help of river towns and cities in cleaning up stream pollution is sought by the committee of Pennsylvania State officials charged with determining how best to do the job in the shortest possible time. The five Cabinet members recently named to the committee by Governor Martin were organized Aug. 31. Chairman William S. Livengood Jr., Secretary of Internal Affairs, declared: "There enters into the problem not alone the matter of industrial waste but of municipal sewage dumped into our streams at many points. This involves co-operation of local municipalities, which

we must and will have. . . . We look for some very early and practical results, meaning within this year."

Mr. Livengood said a program of loans and municipal authority agencies would be considered to enable committees to carry out purification programs. He added that most of the purification work would have to be a post-war undertaking. Many firms on the Schuylkill River, first to be studied, he said, already have agreed to stop dumping waste in the stream, but he pointed out that the principal problem there is to stop mine waste entering the river. "We will have to find some way of permanently disposing of coal silt—making it into a byproduct or by engineering work of deepening to stream's channel so it will take care of itself," he said.

A new four-point program to reduce stream pollution resulting from coal-mine waste was advanced Sept. 24 by Richard Maize, State Secretary of Mines and a member of the State committee charged with river purification, in a letter to all bituminous and anthracite mine owners, as follows:

1. Individual companies were urged to make immediate reductions in the quantity of waste dumped in streams.
2. A committee of operators was suggested to meet with the State anti-pollution group.
3. Facilities of the Mellon Institute, Pittsburgh, and Pennsylvania State College were recommended as possible sources

of finding some practical means of neutralizing the acid and caring for the iron salts contained in mine water.

4. A study of breaker waste was urged as a means of discovering new ways to impound silt.

New Preparation Facilities

ALABAMA BY-PRODUCTS CORP., Truco, Ala.—Contract closed with Deister Concentrator Co. for 16 SuperDuty diagonal-deck No. 7 coal-washing tables in new plant replacing that recently destroyed by fire.

COLYAR CO., Dragondale Breaker, Mt. Carmel, Pa.—Contract closed with Deister Concentrator Co. for two SuperDuty diagonal-deck No. 7 coal-washing tables, one to treat No. 1 buckwheat and one to handle barley coal.

DERING COAL CO., Eldorado, Ill.—Contract closed with McNally-Pittsburg Mfg. Corp. for one McNally-Norton automatic unit washer to treat 25 t.p.h. of hand-picked rejects, complete with dewatering and loading facilities; to be completed about Jan. 15, 1944.

EAGLE HILL COAL CO., St. Clair, Pa.—Contract closed with Deister Concentrator Co. for two SuperDuty diagonal-deck No. 7 coal-washing tables, one to treat No. 1 buckwheat and one for rice coal.

HAVEN COAL & SUPPLY CO., Reynolds, Pa.—Contract closed with Deister Concentrator Co. for one SuperDuty diagonal-deck No. 7 coal-washing table to treat No. 4 buckwheat coal.

LOCUST VALLEY COAL CO., Morea, Pa.—Contract closed with Deister Concentrator Co. for two SuperDuty diagonal-deck coal-washing tables to treat No. 4 buckwheat coal.

LOWER REGION COAL CO., Shamokin, Pa.—Contract closed with Wilmot Engineering Co. for one Type "D" jig to prepare stove and nut coal; capacity, 18 to 20 t.p.h.

WOODWARD IRON CO., Woodward, Ala.—Contract closed with Deister Machine Co., Inc., for one Deister Plat-O coal washing table to treat recrushed jig middlings.

M. & S. COAL CO., Minersville, Pa.—Contract closed with Deister Machine Co., Inc., for two Deister Plat-O coal-washing tables with normal rated capacity of 15 tons each per hour.

OTTO COLLIERIES CO., Otto Breaker, Branchdale, Pa.—Contract closed with Staples-Sweeney Mfg. Co. for installation of 15-ft.-diameter Chance cone (formerly installed in West End Breaker of West End Coal Co.) to clean pea and larger sizes at rate of 200 to 300 t.p.h. of raw feed input; balance of plant, including pockets, sizing screens, etc., being constructed by Otto Collieries Co.

RYON COAL CO., Pottsville, Pa.—Contract closed with Deister Machine Co., Inc., for one No. 16 Deister Plat-O coal washing table to clean barley coal; normal rated capacity, 15 tons per hour.

SUNLIGHT COAL CORP., Boonville, Ind.—Contract closed with McNally-Pittsburg Mfg. Corp. for additional coal-cleaning facilities including one McNally Norton automatic washing unit complete with necessary clean coal conveyors, refuse



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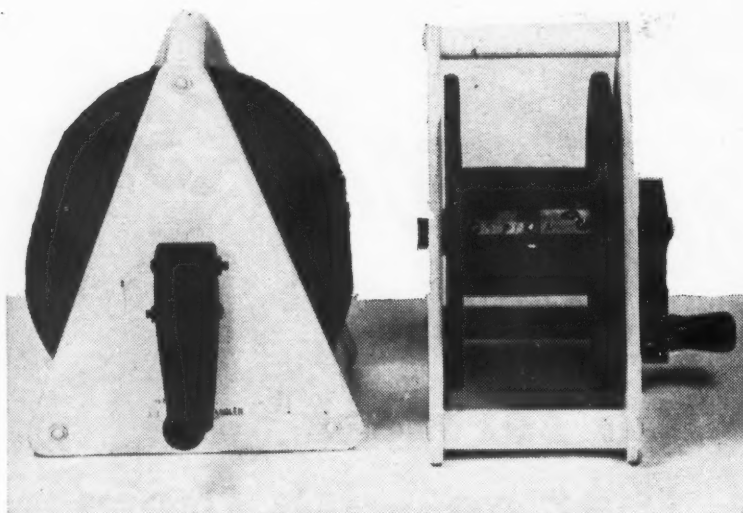
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Roxbury Safety Shot—Firing Cable Reel

This shot-firing reel will eliminate a lot of accidents because it is impossible to shoot with 20 to 25 ft. of cable, as the entire length of cable must be unwound from the reel to get at firing pins. These firing pins are located in a groove in the hub of the reel, and the cable wound around the hub. To shoot, a miner will have to unwind his reel and will naturally walk away from the face to do this.

After the cable has been unwound from the reel you are still short circuited until the battery is put on the firing pins and the face of the battery presses down a flexible spring which opens the circuit between the two firing points.

This reel is especially suitable for conveyor crews and mobile loaders, where a number of men are working together, and there is danger of accidents in shooting. Use of Reel also greatly lengthens the life of the shot-firing cable.

Price of Reel - \$4.50 for 125 Feet of Cable

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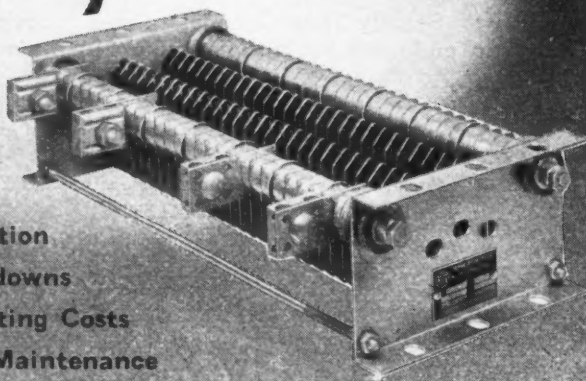
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conveyors and water handling system to treat 300 t.p.h. of 6 in. x 0 coal; to be completed about Jan. 15, 1944.

TRUAX-TRAER COAL CO., Piatt, Ill.—Contract closed with McNally-Pittsburg Mfg. Corp. for sludge-recovery, cleaning and drying addition to handle 75 t.p.h. of minus 10-mesh sludge, sludge to be cleaned in a McNally-Rheo fine-coal cleaning system and dewatered on special fine-coal vibrators; and after receiving mechanical dewatering will be included in dewatered washed screenings and thermally dried in a new McNally-Vissac No. 6620 dryer, which will be an addition to existing McNally-Vissac drying plant.

RAYMOND WREN, Williamstown, Pa.—Contract closed with Deister Concentrator Co. for four Super-Duty diagonal deck coal-washing tables to treat No. 4 buckwheat coal.

To Repair Pittston Cave Damage By Use of Disaster Fund

The Commonwealth's \$200,000 emergency disaster fund was made available to help pay for damage caused by mine cave-ins at Pittston, Pa., through an informal ruling Sept. 4 by the State Justice Department at Harrisburg.

The decision, made by Deputy Attorney General Robert E. Scragg and signed by Attorney General James H. Duff, was made at the request of Adjutant General Robert M. Vail. The latter made the request on receipt of a letter from Richard Maize, Secretary of Mines, asking whether the fund might be used to repair damage to a public school and to State highways within the borders of the city of Pittston. Secretary Maize said "it is estimated that the total cost of all projects in Pittston, including work to prevent possible loss in the future, will amount to about \$895,710."

The State fund will not be used to repair damage to private properties.

Cost of repairing mine-cave-damaged Railroad St., Pittston, Pa., is to be borne by the Pagnotti Coal interests, whose No. 9 workings affected that area. Plans have been submitted and await approval of the highway department.

Harry L. Findlay Is Dead

Harry L. Findlay, 62, vice-president, Youghioghenny & Ohio Coal Co., Cleveland, Ohio, died Sept. 10 at Westerly, R. I., after a short illness. Born in Ireland, he came to this country at an early age, worked his way through college, and entered the employ of Y. & O. in 1902 as a billing clerk.

Promotion to purchasing agent followed, and then he became secretary to F. M. Osborne, first president of the Pittsburgh Coal Co. and founder of Y. & O. Mr. Findlay became successively manager of eastern and Canadian sales and general sales manager prior to becoming vice-president of Y. & O. He also was president of the Simpson Creek Collieries Co., Cleveland, and a director of the Northern Coal & Dock Co., St. Paul, Minn.



Walter L. Robison

Walter L. Robison Passes

Walter L. Robison, 61, president of the Youghiogheny & Ohio Coal Co., Cleveland, Ohio, with which he had been associated for 35 years, died Sept. 12 after being in ill health for about two years. A graduate of Western Reserve University in 1905, he took up shop work with several manufacturing concerns before joining the Y. & O. coal company in 1908 as purchasing agent.

He forged ahead steadily, becoming successively secretary (1910), vice-president and treasurer (1914), and president of the company (1935). He also was president of the Northern Coal & Dock Co., St. Paul, Minn.; vice-president, Simpson Creek Collieries Co., Cleveland; and a director and first vice-president, National Coal Association.

He took an active part in the 1941 wage negotiations with the United Mine Workers covering the northern Appalachian field and was a member of the operators' advisory committee which is working with Secretary Ickes on war problems of the coal industry.

Illinois Maps Program For Mine Education

An educational program to supplement a safety program already in effect was mapped at Springfield, Ill., Sept. 17 following a meeting earlier in the week of a State committee for conservation of manpower in coal mining with the Illinois Mines and Minerals Director, Robert M. Medill. Prepared by Ernest J. Simon, director of vocational education in the State Department of Public Instruction, the educational program is designed to eliminate many accidents being caused by untrained employees. Part of a nation-wide industrial safety program organization sponsored by the National Safety Council, the State committee adjourned a two-day meeting after approving a plan to set up a State-wide safety educational organization. The purpose is to conserve coal-mine manpower by improving mine safety methods.

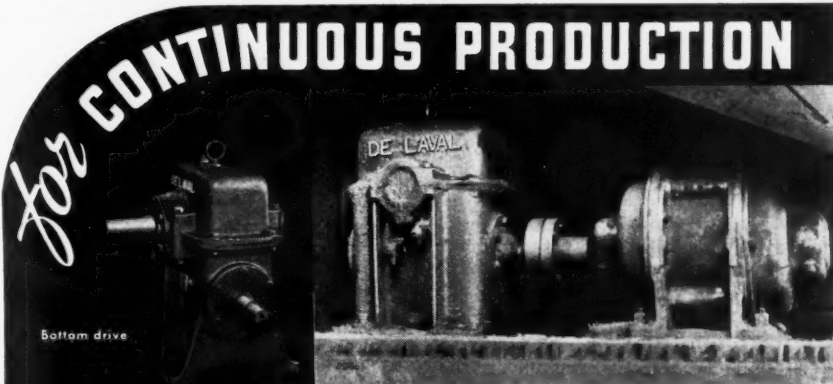


• By Using MESCO COMBINATION JOINT and CROSS BONDS, TYPE M8X-F, mine operators can save 50% on the cost of cross bonding. These conventional Joint Bonds and Cross Bonds, built as a single unit, employ three terminals instead of four as would be the case if separate Joint and Cross Bonds were used. Thus, type M8X-F BONDS require fewer mine welds, less welding rod to buy and less labor to install.

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Breakdowns in power transmission in 24-hour plants are eliminated where plant engineers specify the

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The two moving parts of the gear run in a bath of oil and it is self-lubricating, requiring no attention beyond inspection of the level in the oil well at long intervals.

The unit does not throw grease or oil.

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The efficiency is high, and improves with use.

The drive is smooth and quiet. It is also positive; there is no slippage, regardless of starting torque.

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DE LAVAL WORM GEAR DIVISION
of the De Laval Steam Turbine Co., Trenton, N. J.

Amplidyne Simplified in Talk To Mining Electric Group

David Stoctzel, General Electric Co., Schenectady, N. Y., deflated most of the mystery of the amplidyne in a talk before the Mining Electric Group, West Frankfort, Ill., at the opening session of its sixth year, when he told what it is, explained how it works, and gave some applications. Said Mr. Stoctzel: "This machine is a d.c. exciter devised 30 years ago, to which has been added a compensating field and the fancy name 'amplidyne'." It has two outstanding characteristics: high amplification and high speed response.

The normal exciter may have a power output of, say, 100 times its exciting current. Because of its two-stage excitation, the amplidyne has a power output in the order of 10,000 (100x100) times the controlled excitation input. This means the primary excitation is exceedingly small, being measured in watts rather than kilowatts. It also means that the controller and its resistor are very small because they handle milliamperes rather than amperes, which the conventional controller must carry. The complete resistor for a 300- or 400-hp. hoist motor may be assembled in a cube approximating 8 in. on a side. The controller may have two or three times the usual number of contact points, making control very smooth and exact.

High-speed response is due to the two-stage build-up of the power output of the amplidyne. First, the feeble control current sets up very little choke in the control field circuit, so that it reaches its working value instantly. Second, the short-circuited armature, having very low resistance, causes almost instantaneous build-up to full-load excitation current and amplidyne output. This shorted armature current is the real field excitation for the amplidyne, and delivers the punch that makes amplidyne output lag but a twentieth of a second behind control current. The controlled machine follows with great fidelity the position of the controller handle as to time and speed or position. This characteristic is what gives it such great value for industrial applications.

Has Many Applications

The amplidyne has numerous industrial applications where machine movement must be controlled with promptness and exactness. Besides the control of motors it is used to control generator voltage and power factor. Its numerous uses prompt the idea that it should be classed as a control device rather than an exciter. Each motor drive, or at least each motion, must have its own individual amplidyne control.

Three of the important changes an amplidyne brings about in the control of large motors are: elimination of practically all control contactors, a great simplification of control wiring, and a saving of control space. As an example of space saving, the amplidyne control panel for a stripping-shovel hoist motor requires about one-fourth the space needed for the usual Ward Leonard control panel. Far more important than the saving of space is the elimination of contactors and their maintenance. Because of the smoothness

of control and elimination of overshooting, machinery maintenance is reduced, too.

Most amplidyne applications have been made in recent years. Application to mine hoists and stripping shovels has been in this decade. The new 5561 Marion 35-yd. knee-action stripping shovel of Midland Electric Coal Corp., Farmington, Ill., is one of these installations. Now operating for a year and a half, it has proved the claims for low-cost electrical and mechanical maintenance, said Mr. Stoctzel. It also has demonstrated that shovel movement has been speeded up 5 to 7 percent. This gain in yardage is largely due to the correction of over-

shooting and under-power that resulted with conventional exciters and control.

A new and important application is at a Montana strip mine at the end of a 100-mile 50,000-volt transmission line. Because of the long line and fluctuating load, there was serious voltage fluctuation at the various shovels. This condition has been materially improved by installing an amplidyne on the stripping shovel to back and boost the excitation of the synchronous motor driving that shovel. This regulates motor excitation to conform more nearly to the load. By keeping power-factor fluctuation within narrower limits, voltage is improved. The speed of response is so fast that there is no tendency

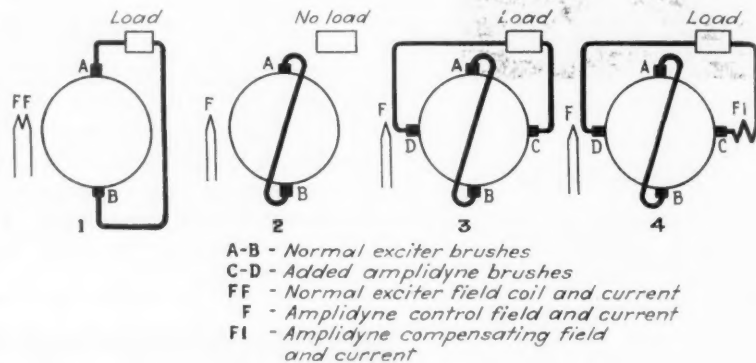
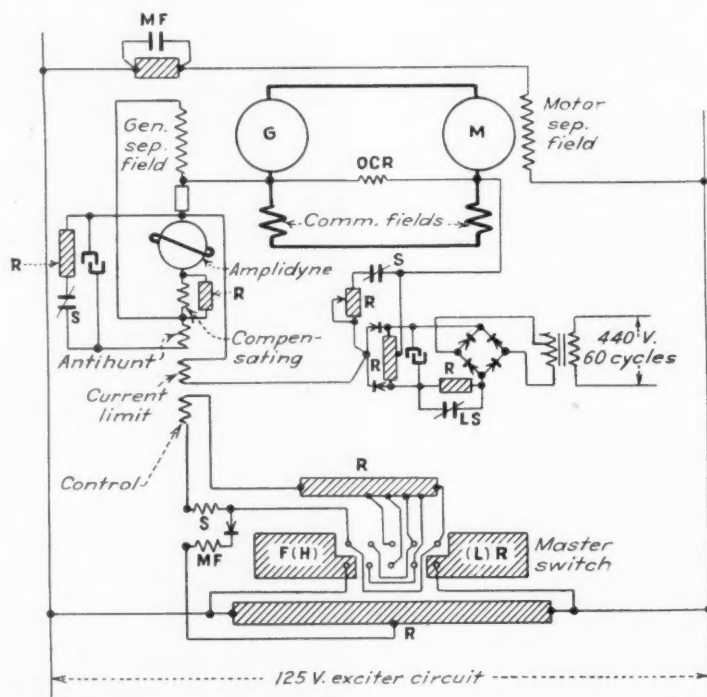


Fig. 1—Evolution of the amplidyne.

1. Normal exciter, normal excitation, normal load; generates an unused cross-current magnetic flux.
2. Short-circuited brushes, 1 percent normal excitation; normal amperes through armature; generates unused cross flux, no load.
3. Added set of brushes, cross flux

now used, load restored in new circuit.

4. Compensating field, FI, added to "neutralize any tendency of the load current to set up its own armature flux in opposition to the control flux. This makes it an amplidyne."



S=Suicide contactor with one additional normally open contact for control brakes, etc.
LS=Low torque limit switch-hoist and crowd (if used)
MF=Motor field contactor (if used). (Must have half voltage coil)
OCR=Over-current relay

Fig. 2—Schematic diagram showing simplified connections of the amplidyne control equipment as used on electric shovels.

for the motor to fall out of step when the shovel digs into the bank.

Mr. Stoetzel believes the gains are so obvious that all new heavy stripping shovels should be amplidyne-equipped for all motions. That requires an amplidyne for each motion. Whether such equipment should be installed on old shovels he considers a matter for individual study, an affirmative decision to be made where investigation indicates the added advantages justify the investment. "Since the amplidyne equipment is relatively small, the cost will not generally be the determining factor to a purchase," Mr. Stoetzel declared.

British Mines Again at Peace: Output Continues to Shrink

After a trying week in which the government appealed for more coal and more men and lost both tonnage and man-hours at an alarming rate, peace again reigned in the British coal industry as Parliament prepared to convene in the fourth week of September. All the men had drifted back to work by Sept. 23 at the Newstead mines, in Nottinghamshire, where more than 15,000 had gone on strike because of the imprisonment of an 18-year-old youth who refused to work underground. About 60,000 tons of output was sacrificed before the youth was released. More than 2,000 workers at two mines in Northumberland, who had been idle for some time, with a loss of about 3,000 tons daily, also had returned.

Continued shrinkage in output is revealed by figures for the four weeks ended Sept. 4, when 844,000 tons less than in the corresponding period of last year was produced. A weekly average of 3,767,800 tons was produced in the above period, besides a record output of 134,000 tons of outcrop coal per week. An unofficial summary of the coal mining situation in Scotland reveals that in each of the three summer months the output was 25,000 tons lower than last year.

Wage-Hour Industry Group Includes Coal Mining

Industry Committee No. 66 for the coal, metal ore, petroleum and natural-gas extraction industries has been appointed by the Administrator of the U. S. Wage and Hour Division. As provided in the Federal Wage and Hour Law, the committee is to investigate conditions in each industry and recommend to the Administrator minimum wage rates for all employees. The committee was to meet Sept. 28 in New York.

M. L. Garvey, Pocahontas Fuel Co., has been named as representative for bituminous coal mine employers; W. W. Inglis for anthracite producers. Other employer representatives are: J. M. Banks, Los Angeles, Calif.; Max M. Barber, Cleveland, Ohio; W. C. Broadgate, Prescott, Ariz., and Charles P. McGaha, Wichita Falls, Texas.

Committee members named to represent the public are: Royal E. Montgomery, chairman, Ithaca, N. Y.; Harold E. Fey, Chicago; Paul F. Gemmill, Philadelphia, Pa.; Robert D. Gray, Pasadena, Calif.; Maurice Merrill, Norman, Okla., and George W. Stocking, Austin, Texas.

Employee representatives are: Charles H. Fell, Washington, D. C.; Joseph R. Kelahan, Alton, Ill.; Thomas Murray, Anaconda, Mont.; Lester Thomas, Wilkes-Barre, Pa.; Lloyd A. Thrush, Springfield, Ill., and Homer Wilson, Strawberry Plains, Tenn. The minimum wage under the Fair Labor Standards Act now is 30c. per hour for all hours up to 40 per week, and time and one-half the regular rate

for hours in excess of 40 during the work week. Provision is made in the law for industry committees to recommend minimum rates higher than the ordinary statutory minimum. Under the provisions of the law, the minimum which can be recommended may not be more than 40c. per hour. The usual practice in the case of industry committees has been recommendation of a minimum of 40c. per hour, and no doubt there will be a strong movement in connection with Industry Committee No. 66 to obtain a 40c. minimum instead of the present 30c. per hour minimum. (Under the provisions of the act, the over-all minimum will become 40c. per hour in 1945.)

To help you "keep 'em rolling" we can assure prompt delivery on a number of standard track equipment items—among them being the Heavy Service Room Frog shown above.

In this Frog, as built by The West Virginia Rail Company, you can have these features of design and construction:

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- Wing ends depressed to prevent catching of any dragging parts of rolling equipment and the catching of men's feet in the flare of the guard rail.

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Mines Bureau to Seek Minerals In U. S. and Alaska

Secretary of the Interior Harold L. Ickes revealed Sept. 7 that the most extensive exploratory program ever undertaken in the United States and Alaska for war minerals had been launched by the Bureau of Mines under a \$3,900,000 Congressional appropriation item, "Investigation of Deposits of Critical and Essential Minerals in the United States and Its Possessions." Mr. Ickes explained that this work is separate from two other exploratory programs being conducted simultaneously by the Bureau—the investigation of raw material sources for steel and the projects designed to increase aluminum production.

Covering areas ranging from north of the Arctic Circle to Texas and from Maine to Washington State, the work will include examinations of industrial diamond areas of Arkansas, exploration of coal fields of Nevada and Oregon, a search for quartz crystals and more than a dozen other important minerals, including copper, asbestos, zinc, mercury, tungsten, vanadium, beryllium and other pegmatites, corundum, molybdenum, manganese, tin, iron, chromium, bismuth and nickel.

In Alaska, said Bureau engineers, the following exploratory projects have been outlined: chromium, 1; coal, 1; iron, 1; mercury, 3; oil (oil shale), 1; tin, 6; tungsten, 1 and zinc-lead, 1.

In the Coaldale region of Nevada the Bureau will explore coal deposits in efforts to determine their extent and establish possible commercial uses for the coal. Under a separate project conducted several months ago in Wyoming, exploratory crews of the Bureau increased the estimated reserves of coking coal in the Kemmerer field by approximately 6,400,000 tons.

Ira Clemens Passes Away

Ira Clemens, for more than 35 years a leading figure in the Kansas coal industry, died Aug. 24 at Pittsburg, Kan. He had retired in 1941 from the presidency of the Commercial Fuel Co., Pittsburg.



Ira Clemens

of which he was one of the original directors and of which he had been vice president for a number of years before becoming president. He also was a former vice president of the National Coal Association and had been a director since 1918. For a long time he was head of the Interstate Coal Operators' Association and was active in the Fuel Administration during the first World War.

More Mines Returned to Owners

Return of coal properties to private owners by the Government Coal Mines Administration continues. Government possession and control of a total of 930 mines has been terminated as of Sept. 24. The mines thus far released have an estimated annual production of more than 35 percent of anthracite and bituminous requirements.

Obituary

CORYDON C. KING, 52, superintendent, Ewen colliery, Pennsylvania Coal Co., Jenkins Township, Pa., died Sept. 15 at his home in West Pittston following a nervous breakdown. At an early age he entered the employ of the Pennsylvania company in its surveying corps. In 1932, when the company's operation was under lease to the Pittston Co. he was named superintendent of No. 9 colliery, Hughestown, being transferred later to the Ewen colliery.

WILLIAM M. GOODWIN, safety inspector for the Republic Steel Corp., coal-mining division, was killed Aug. 29 in the explosion in Sayreton No. 2 slope, Sayreton, Ala. He was a pioneer in first-aid and mine-rescue work in the Alabama field, and had been connected with the company's operations for many years.

I. THOMAS LEWIS, 49, who organized and managed the Shenandoah Coal Co., died Sept. 10 at his home in Pottsville, Pa., after an illness of several weeks. A native of Mahanoy City, he had been an engineer for the Lehigh Coal & Navigation Co., then superintendent of Oak Hill and Pine Hill collieries of the Pine Hill Co. and finally superintendent of strippings at Locust Mountain, Philadelphia & Reading Coal & Iron Co., before forming the Shenandoah company.

JAMES C. BEACH, mechanical superintendent, Colorado Fuel & Iron Corp., with which he had been connected for the last 50 years, died Sept. 3 at Pueblo, Colo.

EDWARD J. MCCROSSIN, 46, director of the safety inspection division of the State Department of Industrial Relations of Alabama, was killed Aug. 29 in the explosion in Sayreton No. 2 mine, Republic Steel Corp., Sayreton, Ala. He received his degree as a mining engineer from the University of Alabama and had held positions as mining engineer with the Alabama Fuel & Iron Co. and other coal-mining companies. When he received his



E. J. McCrossin

appointment four years ago as director of the division of safety and inspection he was chief mining engineer for the DeBardeleben Coal Corp. At the time of his death he was State mining coordinator for the War Production Board.

COL. H. J. WEEKS, president, Durham Land Co., Chattanooga, Tenn., is dead following a lengthy illness. He was a member of the Code Authority, Division 3, National Recovery Administration, and had been identified with the coal industry for many years.

MONROE STAPLES BAILEY, 35, safety inspector for the Woodward Iron Co., Woodward, Ala., died Aug. 31 in a Birmingham (Ala.) hospital, the 22d victim of the Republic Steel Corp.'s Sayreton No. 2 mine explosion, Aug. 29. He was a member of a rescue party. He had recently been appointed by Governor Sparks as a member of the State Board of Mine Examiners. His brother, William Bailey, is superintendent of the Republic company's Sayre mine, Sayre, Ala.

THOMAS A. STROUP, 54, chief engineer and assistant general manager, West Virginia Coal & Coke Corp., Omar, W. Va., died Aug. 27 in an Elkins (W. Va.) hospital. He had been with the company 20 years.

C. E. SAXON, of the Birmingham (Ala.) branch of the U. S. Bureau of Mines, was killed Aug. 29 in the explosion in the Sayreton No. 2 mine of the Republic Steel Corp. He had been connected with the Birmingham bureau as foreman engineer and first-aid and mine-rescue-work instructor for the last 20 years.

MICHAEL KASHA, for 35 years foreman of Highland No. 5 colliery of the Joddo-Highland Coal Co., died Aug. 25 in Mercy Hospital, Wilkes-Barre, Pa.

ROY BENNETT, 29, section foreman at Sayreton No. 2 mine, Republic Steel Corp., Sayreton, Ala., died Sept. 15 from injuries received in the explosion of Aug. 28 at the mine. He was a member of the rescue party. His was the 25th fatality from the blast.

Crichton to Represent Coal In Bible Week Observance

Andrew W. Crichton, president, Johnstown Coal & Coke Co., Johnstown, Pa., has accepted the designation of honorary vice chairman of National Bible Week for 1943, representing the coal industry. Its observance will be Oct. 11-17. Its founder and sponsor, the Laymen's National Committee, was created to stimulate a realization of the important part played by religion in the creation of our government and how vital it is today to everyone—Protestant, Catholic and Jew alike—if liberty and justice are not to perish from the earth.

The committee is distributing a two-color poster to be displayed in store windows, railway terminals, public buildings, hotels, etc. The Salvation Army is prepared to distribute over 500,000 posters from store to store. Bible Week stamps also are to be used by corporations on their mail. The committee aims to have over 100 industries represented this year. The Governor of each state will be asked to issue a formal proclamation on the observance. The committee proposes to open the observance with a coast-to-coast broadcast.

Pennsylvania Group Outlines Proposed New Coal Act

Suggested provisions in a proposed new coal act to replace the Guffey act featured a meeting of the Northwestern Pennsylvania Coal Operators' Association held Sept. 2 at the Willard Hotel, Butler, Pa. Tony Grippo, president of the association, presided at the meeting, which was attended by about 125 including members of the Western Pennsylvania Coal Operators' Association, Central Pennsylvania Coal Producers' Association, the newly organized Mineral Producers' Association (strip mines) and ten members of the subcommittee of the Pennsylvania Joint State Government Commission.

Provisions in the proposed new act include the following:

1. That a coal commission (composed of three, five or seven members) be created to administer the act, such commission to have jurisdiction over all phases and activities in connection with the production, sale and distribution of bituminous coal.
2. District boards to be organized and set up following the pattern of the previous act.
3. Eliminate the statistical bureau as it previously existed. Require district boards to enforce the assembling and reporting of all necessary statistics direct to the commission.
4. Eliminate the Consumers' Counsel as it existed in previous act.
5. District boards to employ and direct all field men, compliance personnel, etc., and require that all employees, other than clerical, have experience in the coal industry.
6. No rules, regulations, orders, directives, etc., to become effective until reasonable notice has been given all per-

sons or parties at interest until after fair hearings have been held.

7. Hearings of disputes, prosecution of violations and presentation of testimony to be within the district in which such acts take place and code members to have right of appeal to courts within or nearest such district.

8. Create an additional district in Pennsylvania, thus making three districts instead of two, as previously. The added district to consist of Armstrong, Beaver, Butler, Clarion, Forest, Lawrence, Mercer, Venango and Crawford counties.

9. Tax of 1c. per ton to be levied to provide funds from which costs of administration and costs of operating district boards may be paid.

10. All mines, other than those operating at time of passage of new act, be required to obtain from the commission certificates of public convenience and necessity before any coal may be produced or sold.

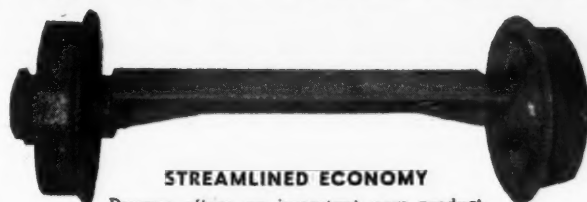
11. Producer to become code member upon signing of the Code of Acceptance.

12. Producers be allowed to load rail coal anywhere within a freight origin group without filing new petitions for different loading points.

13. Producers of less than 50 tons daily be allowed to pool their coal in rail shipments without loading individual carload lots.

14. Producers owning several mines be allowed to sell coal without sales agree-

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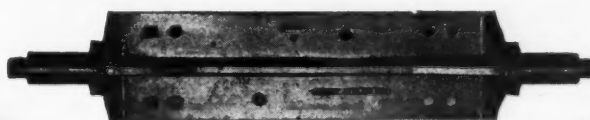
The following results were obtained by placing two axles in hydraulic press, each bolted flat on face of press and bent to a 30° angle on each end of axle: CAST AXLE . . . 225 tons—ROLLED AXLE . . . 200 tons—neither axle showing a sign of fracture.

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LARS and
- 2 CAST-STEEL BOXES

Carefully controlled chemical properties and careful heat treating of cast steel axles will equal the strength of rolled axles. Cast axle weighs only 125 lbs. complete—eliminating 225 lbs. of weight.



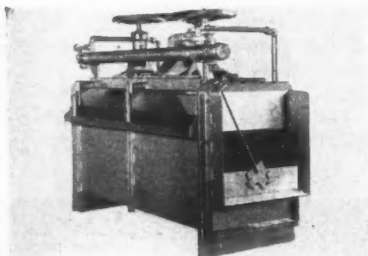
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ments between owned mines and any such coal may be mixed promiscuously without regard to exact quantity from each mine so long as it stays within the said producers' title; provided such mixed coal be priced at not less than the provided minimum price applicable to the highest priced coal in the mixture.

Progressives Win at Benham. Give Up in West Kentucky

Progressive Mine Workers Union (American Federation of Labor) at International Harvester Co., in Harlan County, Kentucky, have again won the right to represent workers in that plant, in an election conducted by the National Labor Relations Board. Hobart Mitchell, president, Local 402, Progressive Mine Workers, stated that final results showed P.M.W., 366 votes, and U.M.W., 275.

District No. 5 of the Progressives has announced its withdrawal from the western Kentucky field, where United Mine Workers will have a clear field. The local Progressive union—J. O. East, president, and John Mattingly, secretary-treasurer—had been in the field since Aug. 22, 1938. It had about 4,000 members. The former Independent Miners' Union merged with the Progressives in 1938, and operated in Hopkins, Christian and Webster counties. The U.M.W. union in the field is District 23.

Draft-Board Interpretations Aired at Williamson

Manpower and maintenance were discussed in an open forum following a joint dinner meeting Aug. 21 at Williamson, W. Va., of the Central Appalachian Section, American Institute of Mining and Metallurgical Engineers, and the Williamson chapter, West Virginia Society of Registered Professional Engineers. With 40 to 50 in attendance, L. I. Cothran, head of the school of mines, Virginia Polytechnic Institute, and chairman of the Central Appalachian Section, presided and the discussion was opened by O. W. Evans, general superintendent, N. & W. Ry. fuel mines.

Mr. Evans lamented the fact that the coal industry has not impressed its workers and the people of the mining communities with the war-effort importance of coal mining. Presumably a better understanding would have influenced draft boards to take fewer men from mining jobs and make the mine workers more satisfied with their part in winning the war. Absenteeism, Mr. Evans said, is greater on the time-and-a-half day than on any other working day of the week. For one reason—among the hand loaders, for instance—most of them are 4-, 5- or 6-car men and do just so much per week regardless of hours per day and work days available per week. Another reason is that someone has spread the false story, believed by some of the less heavy thinkers, that the government gets most of the time-and-a-half day money.

Statistics of the West Virginia Engineering Co. over a 27-year period show that

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Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

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*Shoes -
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DOWNTOWN LOCATION
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Buy War Bonds.
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Save all scrap.
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HYDROTATOR
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more and more tons of coal are being shipped per connected-horsepower of mining machinery, said George C. Barnes, senior engineer of that company. This harder working of equipment coupled with a shortage of skilled men to maintain it, plus a growing tendency toward carelessness of some of the men in operating the equipment has made maintenance a critical factor. Increasing distances of electrical distribution tend to further the difficulties unless substations are moved closer to the face, more of our scarce copper is installed or some innovations are put into practice.

Mr. Barnes mentioned as one innovation the connecting of two 275-volt d.c. substation units in series and using a three-wire 275-550-volt system for driving the existing machinery (Coal Age, July, 1943, p. 65). One mine in Logan County is using that system, thereby reducing energy losses and obtaining better voltage regulation without additional copper. He suggested, for the duration, the possibility of removing frame-to-ground connections from certain types of electrical motors to save the internal damage that now results on grounded motors.

The difference in actions of various local draft boards in deferment of key mining men was evidenced by talks by an attorney, Randolph Bias, chairman of the board in Williamson, and by George B. Baker, chairman of a board at Stone, Ky. Fortunately for coal production in that part of Kentucky, Mr. Baker is vice president and general manager of the Tierney Mining Co. He looks on fuel, including coal, as forming the first line in war effort. Trained men even with good guns are of no value unless fuel aplenty is available at the right time to transport them with their equipment, ammunition and supplies to the front. In contrast Mr. Bias thinks in terms of numbers of men as the first line, the manufacture of the steel for their guns and ammunition next, and the production of coal third.

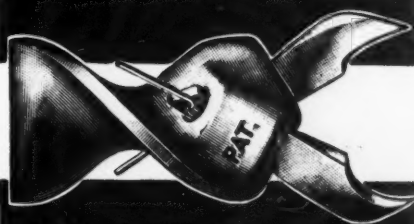
Cloyd Martin, superintendent of the Great Valley Anthracite Corp., McCoy, Va., told of an action of a local O.P.A. office which has reduced absenteeism at the mine. That office appointed him a deputy inspector with authority to take up gas coupons or a whole book from mine workers who have B and C books to enable them to drive to the mine—when those workers are absent without reasonable excuse.

Consol to Dig Coal Under Monongahela River

Consolidation Coal Co. was granted authority Aug. 28 by the Public Land Corp. of West Virginia to tunnel under the Monongahela River at Rivesville, W. Va., for coal to be used in operation of the Monongahela West Penn Service Co.'s power plant. According to Attorney Tusca Morris, the company will mine under the river from its No. 24 operation, bringing out the coal at its No. 97 tippie, at Montana Mines, W. Va. The authority was granted with the stipulation that Consol compensate the State at market value for the coal in place.

The connection between the two mines,

LOST BITS



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★ Drilling problems vary with each coal operation, depending on the seam, the impurities, and other characteristics. But there is ONE problem common to all drilling and that is the matter of lost bits. When you use the McLAUGHLIN POSITIVELY HELD Bit, you no longer LOSE ANY BITS.

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said Mr. Morris, is essential to operation of mine No. 97 because of the demand for increased coal tonnage for the power plants at Rivesville. He added that additional territory must be developed and explained that the required increase in output is not available in No. 97, but is obtainable at No. 24. Consol plans to drive four headings under the river, said Mr. Morris.

Coal-Mine Accident Fatality Rate Continues Below Year Ago

Accidents at coal mines in the United States caused the deaths of 95 bituminous and 16 anthracite miners in July last, according to reports furnished the U. S. Bureau of Mines by State mine inspectors.

With a production of 52,540,000 net tons, the accident death rate among bituminous miners in July last was 1.81 per million tons, compared with 2.28 in July, 1942.

The anthracite fatality rate from accidents in July last was 2.82 per million tons, based on an output of 5,688,000 tons, against 4.68 in the seventh month of last year.

For the two industries combined, the accident fatality rate in July last was 1.91, compared with 2.52 in the corresponding month a year earlier.

Fatalities during July last, by causes and states, as well as comparable rates for the first seven months of 1942 and 1943, were as follows:

UNITED STATES COAL-MINE FATALITIES IN JULY, 1943, BY CAUSES AND STATES

State	Falls of Roof	Falls of Face	Haulage	Underground					Total Underground	Surface	Grand Total
				Gas or Dust Explosions	Explosives	Electricity	Machinery	Other Causes			
Alabama	2			1					3		3
Arkansas											
Colorado	1		2						3		3
Illinois	3	1	1						5		5
Indiana	1						1		2	1	3
Kentucky	5	2	2		1				10	1	11
Maryland	1								1		1
Missouri			1						1		1
Montana	3								3		3
Ohio	7		1			1			9		9
Penna. (bit.)	10		2	1					13		13
Tennessee				1			1		2		2
Utah			1						1		1
Virginia	3					1			4		4
West Virginia	20	3	5		1	1			30	2	32
Wyoming	1		1						2		2
Total bituminous	57	6	17	4	2	3	2		91	4	95
Pennsylvania anthracite	11	1	1		1			1	15	1	16
Grand total	68	7	18	4	3	3	2	1	106	5	111

DEATHS AND FATALITY RATES AT U. S. COAL MINES, BY CAUSES OF ACCIDENTS*
January-July, 1942 and 1943

Cause	Bituminous				Anthracite				Total			
	Number Killed	Killed per Million Tons	Number Killed	Killed per Million Tons	Number Killed	Killed per Million Tons	Number Killed	Killed per Million Tons	Number Killed	Killed per Million Tons	Number Killed	Killed per Million Tons
Underground:												
Falls of roof and coal	352	368	1,056	1,091	90	59	2,583	1,694	442	427	1,201	1,147
Haulage	129	131	.387	.388	20	19	.574	.545	149	150	.405	.403
Gas or dust explosions:												
Local	5	17	.015	.050	5	1	.143	.029	10	18	.027	.048
Major	121	97	.363	.288					121	97	.329	.261
Explosives	13	16	.039	.048	9	6	.258	1.72	22	22	.060	.059
Electricity	30	20	.090	.059	3		.086		33	20	.090	.054
Machinery	25	13	.075	.039	1	1	.029	.029	26	14	.070	.038
Shaft	3	6	.009	.018	2		.057		5	6	.013	.016
Miscellaneous	20	21	.060	.062	8	9	.230	.258	28	30	.076	.081
Stripping or open-cut	14	15	.042	.044	2	7	.058	.201	16	22	.043	.059
Surface	30	34	.090	.101	7	11	.200	.316	37	45	.101	.121
Grand total	742	738	2.226	2.188	147	113	4.218	3.244	889	851	2.415	2.287

*All figures subject to revision.

Tennessee Gas Pipeline Given FPC Approval

Approval by the Federal Power Commission was given Sept. 21 to the proposed natural-gas pipeline of the Tennessee Gas & Transmission Co. from Corpus Christi, Texas, to Cornwell Station, W. Va. The \$47,500,000 line will be 1,228 miles long and will supply an estimated 207,000,000 cu.ft. daily for distribution in Ohio, Pennsylvania and New York. Still unsettled was the application of the Hope Natural Gas Co. of West Virginia, subsidiary of the Standard Oil Co. of New Jersey, which sought approval of an 1,140-mile line from the Hugoton fields in southwest Kansas to its distributing terminal in West Virginia.

J. A. Krug, director of the Office of War Utilities and program vice chairman of the War Production Board, informed FPC on Aug. 28 that a program determination had been made "authorizing issuance of an AA-3 priority for a line and contemplating that materials will be made available commencing in the fourth quarter of this year"—making Oct. 1 the deadline for placement of orders for 215,000 tons of steel required for the line.

In opposing the proposed line, John D. Battle, executive secretary, National Coal Association, as spokesman for the bituminous coal industry, said, in part: "It will be impossible for natural gas to take care of any anticipated shortages in that fuel in that area in the coming winter of 1943-44, but coal can take care of these

needs immediately. We feel that construction of the line at this time will injure and not aid the war effort. The anticipated shortage of natural gas can be taken care of by coal with the expenditure of less than 20 percent of the critical materials required to build the pipeline."

Faulty Sections Replaced In "Big Inch" Pipeline

Deliveries of crude oil to Eastern refineries via the "Big Inch" pipeline are continuing approximately on schedule despite delays incident to the removal and replacement of faulty pipe sections along the New York branch of the line, the Petroleum Administration for War announced Sept. 13. Decision to replace certain sections of pipe on the New York branch was prompted by development of a few split joints in the pipeline, caused by faulty factory-welded seams.

Crude oil destined for New York refineries had to be diverted temporarily through the second "Big Inch" branch to refineries at Philadelphia, whose requirements are sufficient to absorb practically all current throughput capacity of the pipeline. Meanwhile, New York refinery requirements were fully met by other pipelines, tank cars and water transportation facilities.

New Coal Branch Presages East Kentucky Expansion

Approval for the construction of a 10-mile branch of the Louisville & Nashville R.R. from Cornettsville up Leatherwood Creek in the Hazard district of eastern Kentucky has been granted by the Interstate Commerce Commission. This branch will tap several thousand acres which is to be developed on an extensive scale. Much of the preliminary work has been done. Plans call for one of the largest coal-mining towns in the eastern part of the State. When development is well under way, with modern mechanized equipment, it is said that coal will be drawn from Perry, Letcher, Leslie and Harlan counties.

Utah Wagon Mine Operators Seek Unloading Ramps

A group of wagon-mine operators from Huntington Canyon, Utah, meeting late in August with Governor Maw of Utah, asked support of the State in having coal unloading ramps constructed at Price, Carbon County center, so that wagon mines can ship by rail from that point. The wagon operators were accompanied by representatives at the Office of Defense Transportation and the Ninth Service Command. The wagon operators pointed out that under present truck and tire rationing practices they were not able to get their potential production transported to the market. The plan they advocated is to use all their truck equipment on the comparatively short haul. They said that O.D.T. had taken the position that coal is a commodity which should be moved by rail only and that trucks cannot be made

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available for the purpose. This has resulted, it was stated, in a falling off of the production of wagon mines not served by a railroad.

Half a dozen wagon mines were represented at the conference. A spokesman told the Governor that these six mines could produce from 250,000 to 300,000 tons a year if transportation to consuming centers was available. Further, it was stated that other wagon mines in Carbon and Emery counties could and would make use of the proposed unloading facilities. It was indicated at the conference that the Army might be interested in assisting the project.

Coal-Preparation Course Started in Coaldale

A class for the study of coal preparation was organized Sept. 9 by W. Julian Parton, preparation engineer, Lehigh Navigation Coal Co., for the benefit of the breaker forces of the eastern end of the Southern Anthracite Region. This class will be held at Coaldale (Pa.) High School, where it will be convenient for all the preparation employees at Lansford, Coaldale, and Tamaqua collieries, of the Lehigh Navigation Coal Co., Inc. It will be conducted under the auspices of the School of Mineral Industries Extension Department, Pennsylvania State College, State College, Pa.

This new course will supplement the program of vocational education in coal mining which for three years has been conducted at Coaldale High School. When the organization meeting was held 20 persons presented themselves for enrollment. Mr. Parton is a graduate of mining engineering from the Pennsylvania State College and the University of Washington.

To Award Coal Pace Setters Certificates of Merit

Miners who paced coal production in the Alabama field during July will be awarded certificates of merit through the Birmingham office of the War Production Board in recognition of their service to the war effort in that State, according to Harold McDermott, chairman of the public relations committee of the Alabama Mining Institute.

Certificates will bear the signatures of Governor Chauncey Sparks; Col. James P. Barnes, district manager of WPA; Lt. Col. William J. Rushton, deputy assistant chief, Birmingham Ordnance District, and Mr. McDermott, representing the Alabama Mining Institute.

Harlan Mine Blast Kills 12

Eighteen miners were trapped—of whom 12 died—by an explosion Sept. 16 that closed a tunnel in the Three Point mine of the Three Point Coal Corp., 12 miles south of Harlan, Ky. Six miners who barricaded themselves against black-damp about a mile from the mine entrance were rescued after more than eleven

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This picture actually happened!—not once but several times. The fact that runaway trips pass through American Doors safely emphasizes the fact that regular trips proceed through them without stopping—increasing mine output—eliminating trapper-boy and all hazards at the doors—maintaining air flow currents. Let our engineers demonstrate that savings actually pay for safety equipment. Write American Mine Door Company for complete descriptive catalogue.

hours by squads led by James Bryson, safety director of the Harlan County Coal Operators' Association. Six members of the rescue squads were overcome by fumes.

Iowa Producers' Association Succeeds Producers' Board

Coal Producers' Association of Iowa has been organized with offices in the Fleming Building, Des Moines. Formed to succeed the District 12 Producers' Board, and Iowa Coals, Inc., it is composed of truck and rail operators. It aims to serve as general information office for the industry and to represent its members on broad policy matters.

Officers are: president, S. Harvey Blount, Central Service Co.; vice-presidents, Owen McConville, McConville Coal Co., and John D. Shuler, Shuler Coal Co.; treasurer, B. J. Powers, Dallas Fuel Co.; executive secretary, M. G. Youngquist; board members, K. G. Carney, Scandia Coal Co., and V. P. Smith, Blackstone Coal Co.

Training Courses Started To Improve Safety

In-plant training courses for 625,000 foremen to improve safety conditions in war production started in September, according to Secretary of Labor Frances Perkins. They are being directed by many of the 40,000 war-plant supervisors who have completed safety training courses conducted in 116 engineering colleges.

Training will cover specific safety problems of the plant and industry. Special agents of the national committee will assist supervisors in class instruction. Outlines, guides, text material, references and supplementary bulletins have been prepared by the Labor Department's Division of Labor Standards.

Consultation service also is offered to smaller war plants by the special agents of the Department of Labor. Safety records of over 10,000 plants serviced by them last year show a marked reduction in accident frequency in 66 percent of the cases. More than a million man-days were saved to war production as a result of their efforts.

Information about the free supervisory training courses may be obtained from the Division of Labor Standards, U. S. Department of Labor, Washington, in the leaflet "What Would You Pay for 3000 Years' Experience?"

Coal Rank and Type Determine Its Hydrogenation Value

In determining its value for hydrogenation purposes, too much stress has been laid on the percentage of fixed carbon in the coal, whether anthracite, bituminous, subbituminous or lignite—that is, on its rank or maturity—and too little on its type; whether the coal is bright, semi-splint, splint, cannel or boghead; declare C. H. Fisher, G. C. Sprunk, A. Eisner, H. J. O'Donnell, L. Clarke and H. H.

Storch, U. S. Bureau of Mines, in "Hydrogenation and Liquefaction of Coal, Part 2—Effect of Petrographic Composition and Rank of Coal," Technical Paper 642, price, 25c.

Part 3 of the same series, prepared by L. L. Hirst, A. Eisner, J. H. Field, H. M. Cooper, R. F. Abernethy and H. H. Storch, is entitled "Characterization of Assay Oils"; price, 10c.

Swimming Pool Constructed In Panther Valley

A swimming pool 200 ft. long and 100 ft. wide has been constructed by the Lehigh Navigation Coal Co. on the line between Lansford and Coaldale for the people of Lansford, Coaldale and Summit Hill. The expense is being met by a subscription drive, and the company has agreed to match, dollar for dollar, the contributions of the citizens of the three boroughs.

Twenty feet at one end of the pool for the whole width of 100 ft. will be 1 ft. deep and will be used by the kiddies for wading. The greater part of the pool will be 5 ft. deep, but the depth of the far end of the pool will be 9½ ft. and this end will be used by divers. The pool, which is cemented on bottom and sides, was completed in 37 days from its commencement and was used for about one month, but the cold weather has caused its use to be suspended.

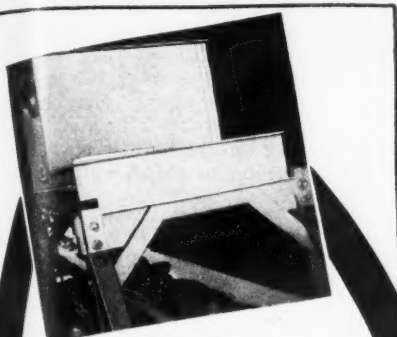
A bathhouse with conveniences for washing prior to entering the pool, which

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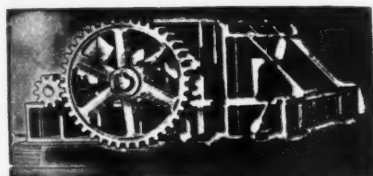
Applied to any size belt conveyor, either horizontal or inclined. The Weightometer gives a simplified and dependable record of your production, without interrupting the flow of coal.

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Seven (7) sizes afford a capacity range from 50 to 1000 tons per hour.

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ablutions will be obligatory, is to be erected. The water will be chlorinated. Already a large skating rink has been constructed at the foot of the hill. The swimming pool could not be used for skating, for the expansion of the water on becoming frozen would break the concrete. Funds for operation and control of the pool and rink and of the small park with its landscaping will be provided by the boroughs of Lansford, Coal Dale and Summit Hill.

Coal-Processing Fund Set Up At University of Kentucky

Governor Johnson of Kentucky has announced transfer of \$10,000 from his general emergency fund to the College of Engineering, University of Kentucky, to enable continuation of experimental work on low-temperature distillation of coal and shale in producing synthetic gasoline and other byproducts of coal. This work is intended to help solve prospective future shortage of petroleum products. Governor Johnson contends that the byproducts obtained from coal by distillation processes are of great prospective value in the war effort.

Southeastern Kentucky, especially the Harlan field, which has great deposits of high-grade byproduct coal, has been especially interested in the proposed development by the university, as has the entire State's coal industry, as it is considered likely to create better markets for low-grade coals.

Kentucky Institute Elects

The Kentucky River Mining Institute, Hazard, Ky., has elected new officers, as follows: Orvall Hughes, Scuddy, Ky., president; C. Prewitt Gumm, Anco, Ky., first vice president; R. L. Watts, Jeff, Ky., second vice president; J. B. Allen, Hazard, Ky., secretary-treasurer. Executive committee—John M. Wood, Glowmar, Ky.; Frank Vance, Blue Diamond, Ky.; George P. Fitz, Ajax, Ky.; H. M. Gallagher, Harveytown, Ky.; Warren Hayden, Hardburly, Ky., and P. A. Grady, Allock, Ky. A meeting of the new officers was held at Hazard Sept. 24, at which plans were made for the new year.

To Test for Coal in Colorado

In the hope of developing an important coking-coal industry in Gunnison County, Colorado, the U. S. Bureau of Mines is preparing to conduct churn drilling tests of coal deposits in the Paonia region, according to an announcement by Lewis K. Jacobsen, district Bureau of Mines engineer for Colorado. The drilling will be done under the direction of Alfred L. Toenges, coal-mining engineer for the U. S. Bureau of Mines, with James A. Dowd as project director for the Bureau.

Preparation for testing of the Minnesota Creek coal properties in the eastern end of Delta County is progressing under the direction of the Bureau of Mines, the U. S. Grazing Service and Geologist D. A. Andrews, Washington, D. C.



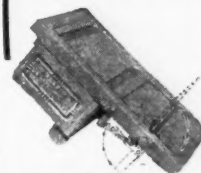
Stearns

Suspended MAGNET at DUQUESNE PAYS FOR ITS OPERATION

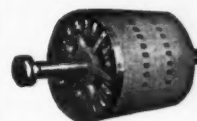
This 65" Stearns Suspended Circular Magnet above the head pulley of the main belt conveyor at the Warwick mine of Duquesne Light Co. recovers enough scrap metal to pay for its operation.

But—the important feature of this magnet installation is that it protects crushers and, eventually, stokers.

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Spout Magnets



Magnetic Pulleys



Suspended Magnets

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New Mine Being Developed On Old Sheridan Holdings

George Bell has purchased the Sheridan Coal Co. holdings, including nearly 1,400 acres of land, in Fremont County, Wyoming, and is developing a new mine, it is reported. The tract is said to include from 400 to 600 acres underlaid with thick coal seams, which will be made accessible through the Hudson Coal Co. shaft adjacent. Mr. Bell is pushing the dismantling of equipment at the Hudson No. 2 mine, which will be used in the new mine, at Alkali Buttes. Mr. Bell says he hopes to be able to produce 300 tons of coal daily, though he is handicapped by a shortage of materials.

Evans Colliery Resumes

After being idle about a year, the Evans colliery of the Evans Coal Co., Beaver Meadows, Pa., resumed operation in mid-September. It was expected that it would take several weeks to reach full production, when probably more than 100 men would be at work.

Corbin Mine Being Reopened

Consolidated Mining & Smelting Co. is reopening the Corbin coal mine, in British Columbia about 40 miles from Fernie, which closed some years ago. Once one of the province's well-known mines, it has a large seam of lower grade coal. Plans are progressing somewhat slowly because of manpower difficulties.

Ohio Strip Tract to Be Opened

A large acreage of coal land southwest of Zanesville, Ohio, has been acquired by the Ohio Power Co. and is to be developed into a large strip-mining operation to supply coal for the company's power plant at Philo, it is reported. Between 3,500 and 4,000 acres is included in the purchase.

Coal deposits in the land are said to range between ten and twelve million tons, which will be stripped by the Mauger Construction Co., Columbus, Ohio. More than half a million tons is to be produced annually. A spur of the Pennsylvania R.R. has been constructed to the tract.

New Premier Plant Ready Soon

Operation of a new mine opening of the Premier Pocahontas Collieries Co. property at Premier, W. Va., is expected to begin about Dec. 1, according to company officials. The Sharondale (Ky.) tippie which will be moved to Premier to meet the needs of the new opening (Coal Age, September, p. 139) will be equipped with new screening.

Mechanically equipped with Goodman duckbills and other new equipment, including mechanical loaders and cutting machines, the new plant will employ at least 100 additional men.

Grading and excavating on the new operation is now under way with the Walton-Sudduth Construction Co., Bluefield, in charge. Erection of the tippie will be in charge of the Kanawha Mfg. Co., Charleston.

New Strip Operation to Yield 4,000 Tons Daily

Four new strip mines being worked by the Pittsburgh Coal Co. in Pennsylvania at Russell, Chambers, Houston and Imperial are yielding up to 2,550 tons of coal daily and by midwinter will be producing 4,000 daily. The tracts probably will yield 4,000,000 tons and it will take three years to complete the mining. About 250 men are working on the project.

New Merritt Mine Opened

Diamond Vale mine, at Merritt, B. C., Canada, was opened late in August. The company is managed by George Murray, former superintendent of Coalmont Collieries, and is owned by the Merritt Coal Mines, Ltd. The Canadian Pacific Ry. is laying a spur track which will permit shipments of the coal to coast markets, it was stated. Among recent visitors at the mine were E. C. Carson, Minister of Mines; the Attorney General, and Chief Mine Inspector James Dixon.

Exeter Shaft Reopened

Exeter shaft of the Knox Coal Co., Exeter, Pa., was scheduled to be reopened Sept. 28, according to an announcement Sept. 24 by R. L. Dougherty, general manager. Closed for the last 10 years, the shaft will be used exclusively for raising and lowering men, while the Schooley

Slope, used heretofore by the men as well as for raising coal, will be used entirely for the latter purpose.

With a daily output of about 500 tons, the mine employs about 125 men, but Mr. Dougherty said work will be available for 250 more men in the next six months. Ultimate production, he added, is expected to reach 2,000 tons daily.

Jermyn-Green Breaker Shaping Up

Work on the construction of a new breaker for the Phoenix Coal Co., one of the Jermyn-Green interests, at Phoenix Park, Pa., is progressing rapidly under the direction of Elkins Reed, superintendent. Through the use of 4,000-gal. buckets the three shafts are being dewatered at the rate of a bucketful every 40 seconds. Old airshafts are being relined and debris from the previous operation is being removed. In addition to Mr. Reed the personnel is as follows: Paul Sieber, purchasing agent; Frank Kaczinski, outside foreman; Richard Pennman, inside foreman; and Thomas E. Flannigan, weighmaster. A temporary slope has been driven and P. Marianelli, of Scranton, is stripping certain coal areas for the Phoenix operation.

Wyoming Stripping to Open

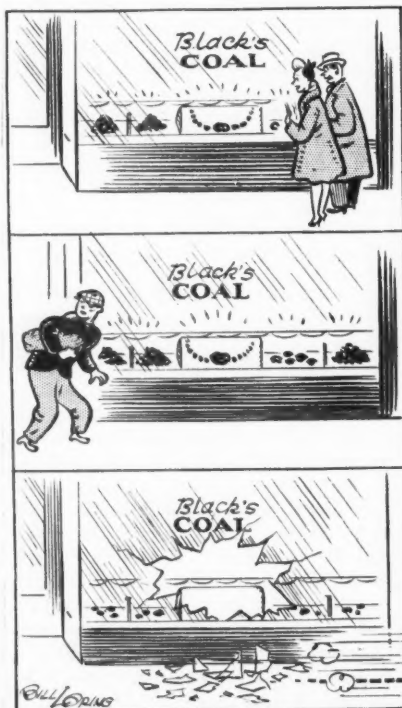
Operations at a new strip mine at Echeta, 26 miles west of Gillette, Wyo., were scheduled to begin between Sept. 1 and 15, according to an announcement on Aug. 4 by Lawrence Loechner, president of the Echeta Coal Co., of Omaha, Neb. The new operation, said Mr. Loechner, is to have an annual output of half a million to a million tons. Preliminary testing had been under way for several weeks at the time of Mr. Loechner's announcement and tracks had been staked out by the Burlington R.R.

Bituminous Coal Institute Plans Publicity Campaign

Bituminous coal, America's leading source of wartime power and postwar prospect for scientific applications in many fields, soon will launch the first comprehensive institutional advertising campaign in its history, according to Harry M. Vawter, director of the Bituminous Coal Institute, New York City. The campaign will be placed through the Arthur Kuder, Inc., agency.

"There is little to indicate that the public knows the truth about the \$4,000,000,000 bituminous coal industry," stated Mr. Vawter. "Few people, for instance, know how it was possible for the industry virtually overnight to gear itself for the stupendous job of producing the tonnage necessary for turning out the ships, guns, tanks and planes in the quantities needed to win the war.

"Yet it is a fact that during the years of financial depression, when other industries were retrenching, the bituminous coal operators dug deep into their pockets



BOWDIL BITS

are

Ammunition on the Home Front!



Save Steel

The NEW Bowdil Concave bit has an important job today . . . cutting more coal, faster to supply America's war-time fuel requirements. But, Bowdil bits can continue this vital "Home Front" job only if they are properly used and maintained. To help you take care of your Bowdil bits so that they will take care of you we have listed at the right several important maintenance and use suggestions:

1. **SAVE STEEL!** — Distribute cutter bits from supply house and require all bits to be returned for inspection before scrapping. Bits turned in with only one point unused or not fully worn out should be sent back for further use.
2. Oil cutter chain at least after several places have been cut, and always upon completion of shift.
3. Tighten bits properly and reduce bit loss.
4. Keep cutter chain adjusted $\frac{3}{4}$ " slack under frame in most cases.
5. Be sure cutter head is tight. When worn or too open, report to maintenance authority.
6. Don't operate chain unnecessarily when not actually cutting coal. This practice is a safety hazard and wastes steel by dulling bits.
7. Use care in setting jacks so bits will not strike them.

Ingenuity will help too . . . perhaps your operating men can prolong the use of these bits by 10%, 5% or even 1%. Remember—a pound of alloy steel saved NOW is worth a TON after the war.

The BOWDIL Company
Canton COAL CUTTING EQUIPMENT Ohio

to inaugurate a modernization and mechanization program that enabled them to produce a record volume of coal in 1942 despite the loss of some 70,000 employees to the armed forces and other war industries. During the past 20 years the industry has spent approximately \$400,000,000 for mechanical equipment and facilities to make coal mining more efficient and safe.

"The industry is proud of the vital part it is playing in the war effort. Only a progressive and well-managed industry could have turned in such remarkable achievements. We feel the public has a right to know more about an industry that supplies 55 percent of all our mechanical energy, powers 95 of every 100 railroad locomotives, generates 55 percent of our electricity, heats four out of every seven homes, is the base for 85 percent of all war plastics, and has 60,000,000 customers. "Bituminous coal has no immediate

sales problem even though the 1943 production goal of 600,000,000 tons is the greatest ever mined by any country in a single year. The industry, however, realizes it has a selling job to do. It must sell itself and its products to the public if it hopes to hold and to increase its markets in a postwar world."

Discussing bituminous coal's part in the postwar world, Mr. Vawter said: "Bituminous coal promises to be the mainstay of scientific developments of the future. In the development of coal-hydrogenation lies the best hope for replacement of our dwindling petroleum reserves with gasoline for expanded automobile and airplane traffic.

"In the drug, dye, plastic, synthetic rubber and other fields, bituminous coal is the basic source from which new products will be derived. The plastics and synthetic resins industry, for example, is not a war baby. Quite the contrary. Many foresee

a brilliant and lasting future for it in the postwar years ahead, a future which is backed by the vast reserves of bituminous coal."

The campaign will be placed in magazines and trade publications with an estimated total of 50,000,000 readers. Magazines include the *Saturday Evening Post*, *Life*, *Newsweek*, *American Home*, *Atlantic Monthly* and *Harpers*. In addition, space will be bought in coal, coal-mining and building trades papers.

Liberty Fuel Workers Get Group Insurance

Employees of the Liberty Fuel Co., Salt Lake City and Latuda, Utah, totaling 103, are eligible for life insurance through a group policy acquired by that company. The policy, involving a total of \$115,000, was issued by the Prudential Insurance Co. of America. The Salt Lake City workers are to receive coverage of \$2,500 each and the others of \$1,000. Both the employees and the employing company will share in payment of the premiums.

New Books on Subjects Relating to Coal

Diesel Engines Underground; V—Effect of Sulphur Content of Fuel on Composition of Exhaust Gas, by L. B. Bergen. M. A. Elliott, J. C. Holtz and H. H. Schrenk. U.S.B.M. R.I. 3713; pp. 13; mimeograph.

Some Information From an Investigation on Methods of Confining Cardox Blasting Devices in Boreholes in Certain Coal Mines, by F. E. Griffith and C. H. Seeling. U.S.B.M. R.I. 3714; pp. 13; mimeograph.

Chronic Pulmonary Disease in South Wales Coalminers; II—Environmental Studies—Medical Research Council Special Report Series 244; pp. 222; paper boards. British Bureau of Information, New York, N. Y. Price, \$2.90.

A Device for Sampling Material Carried by Silt-Bearing Streams, by Harry F. Weaver, U. S. Bureau of Mines, I. C. 7249; mimeograph.

Some Preliminary Data on Methods for Allaying Coal Dust in Tipples and Cleaning Plants, by D. S. Kingery, U. S. Bureau of Mines, I. C. 7248; mimeograph.

How to Pass a Written Examination (how to prepare for examinations mentally, physically and emotionally; how to answer both objective and essay-type questions; more than 150 suggestions), by Harry C. McKown. McGraw-Hill Book Co. 162 pp., 5½x8½ in.; cloth; price, \$1.50.

Coal Dust on the Fiddle, Songs and Stories of the Bituminous Industry, by George Korson. University of Pennsylvania Press; 460 pp., 6x8½ in.; cloth; price, \$3.50.

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ENGINEERS AND BUILDERS OF
MODERN COAL OPERATION
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Complete coal company management
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Mine Operation, Management
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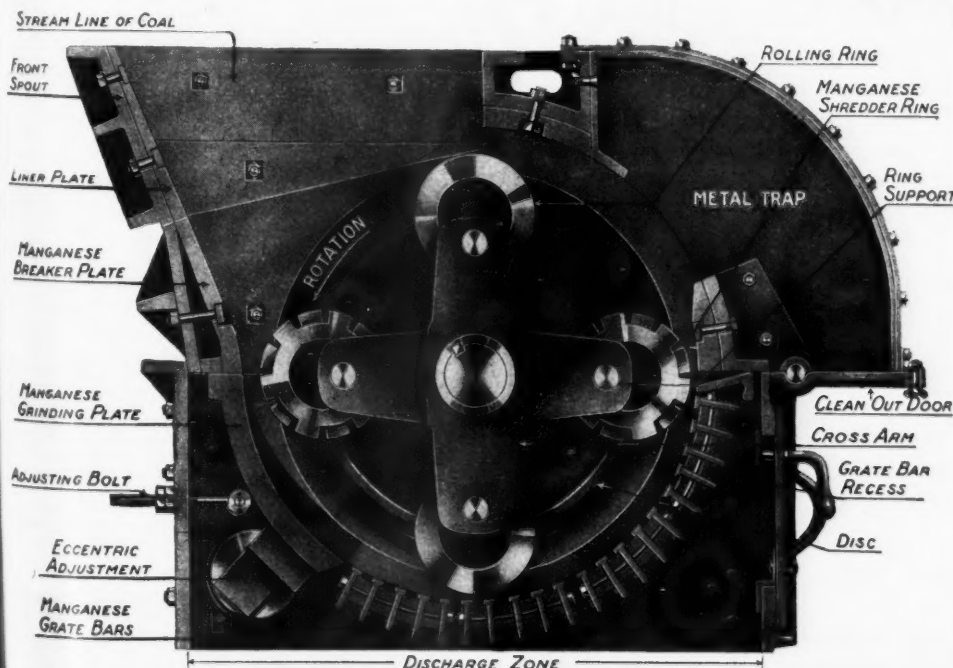
READERS MAY CONTACT THE CONSULTANTS

whose cards appear on this page
with the confidence justified by the offering of these special services nationally.

Externally adjusted Easily accessible Compact

● The American Rolling Ring Crusher is built in many sizes and each unit is arranged to meet the particular requirements of application. Compactness is an installation advantage—external adjustment, easy accessibility, and exceptional power are production advantages.

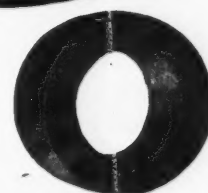
You can amply and economically provide for your crushing requirements with the American Rolling Ring Crusher. It speeds up the work by staying on the job and by action of the crushing parts. The American Rolling Ring Crusher is built in many sizes. Each unit is arranged to meet the particular requirements of each application. We will be glad to thoroughly survey your requirements and recommend only such equipment needed for your specific purposes. Each crusher guaranteed for the job.



The splitting action of the SHREDDER RINGS shatters and distributes the coal before it reaches the Breaker and Grinding Plates.

These patented reversible manganese steel SHREDDER RINGS are found only in the American Rolling Ring Crusher. They have twenty cutting edges or teeth and are designed to maintain their outward position by centrifugal force at the specified speeds. In contact with solid metal, the rings are momentarily deflected from their usual course because they are free to swing back out of position. There are no shear pins or other safety devices that require attention.

AMERICAN
Type "S"
**ROLLING RING
CRUSHER**



**Metal Trap or
Tramp Iron Catcher**

The fact that the rings are thrown back when they encounter non-crushable material protects the crusher from damage by foreign materials. This flexibility or "give" makes the crusher self-acting against tramp material. In order to trap this material, the "S" type of American Ring Crusher can be equipped with a metal trap or tramp iron catcher. This device catches tramp iron, wire, and other non-crushable materials.

The Grinding Plate is adjustable, a feature that lengthens its life. It is adjustable by means of an eccentric movement and can be adjusted while the crusher is in operation. This feature makes it possible to vary the size of the finished product.

AMERICAN PULVERIZER COMPANY 1119 MACKLIND AVENUE
ST. LOUIS, MISSOURI
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS



"It's here to do a job, Pal—and soon!"

"We can't get along without plenty of that *friendly* wire rope. What does it do? Just stick around, soldier—and how do you think that souped-up bronco you're running around in got off the boat? Wire Rope!"

The guard is right. It takes a lot of easy-handling wire rope to move the stuff an Army needs. Think of North Africa—think of Sicily! And there has to be *enough* of it!

That's why you and we at home here have to conserve the wire rope we use.

But when you do need to order replacements, won't you please accept it *without* reels, if lengths permit, so that handier reels can be spared for the boys out there? Wickwire Spencer Steel Company, 500 Fifth Avenue, New York 18, N. Y.



Wickwire Spencer, the first in New England to be awarded the Maritime M and Victory Fleet Flag, has now received the GOLD STAR for maintaining excellence of production.



DO YOUR MEN KNOW PROPER SHEAVE DIAMETERS?

Our FREE book, "Know Your Ropes," will tell them. It tells why a sheave that is too small wears out rope fast. It shows how to figure the right size sheave for every diameter of rope . . . and gives numerous other "Life Savers" that will help make your present wire rope last longer. Send for your free copy, today!

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MEET THE CHAMPION "BUILDER-UPPER"

When it comes to rebuilding worn parts, Harcote is the real champion electrode that gets in there—puts on a hard surface that's tough and long-lasting. An important time and money-saver, too! When worn parts would take weeks to replace—Harcote does the job quickly—at a fraction of the new part cost—gives you a part that will outwear the original.

Harcote is ideal for welding on carbon steel, low alloy and high manganese surfaces.



*A New Star Has Been Added to
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See your P&H representative for procedures. Also ask about P&H electrodes for any other welding requirements.



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HARNISCHFEGER
CORPORATION
WELDING ELECTRODES - MOTORS - HOISTS - P&H - ELECTRIC CRANES - ARC WELDERS - EXCAVATORS

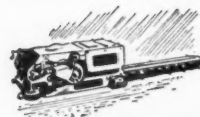
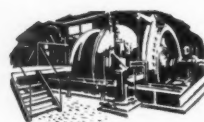
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FRICTION MATERIAL



Engineered to your Specifications



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Velvetouch

THE S. K. WELLMAN CO.

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CLEVELAND, OHIO, U.S.A.

PIONEERS IN PUTTING POWDER METALLURGY TO WORK FOR INDUSTRY

"I was one of the wise guys!"



"Nuts," I used to say to this Mack salesman. "I should pay you more for a truck when I can get another kind cheaper? So what if it ain't as good? I run the hell out of it—then I buy me a new one. That way I'm ahead of the game and I always got a new truck, see?"

I was a smart apple, I was. Yeah.

Now look at me—right behind the eight-ball. Sure I still got a truck and I'm stuck with it for the duration! What that junkheap is doing to me shouldn't happen to Hitler.

And that ain't all. That brother-in-law of mine, Benny, he bought a Mack 'way back, and he ain't letting me forget it for a minute.

You shoulda heard him last night. "Just like I always say," he crows. "You pays your money and you takes your choice. Now you take that Mack of mine. That baby's been over a hundred thousand miles and I ain't had the case down yet. Never missed a trip, and what's more, the way she's running, I know I ain't going to!"

Personally, I still think somebody dropped Benny on his head when he was a baby. But here lately, I'm beginning to think it didn't do him no harm.



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TRUCKS

FOR EVERY PURPOSE

ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS



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N. J. Factory branches and dealers in all principal cities for
service and parts.

IF YOU'VE GOT A MACK, YOU'RE LUCKY...IF YOU PLAN TO GET ONE, YOU'RE WISE!

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TREET
U. S. A.
STRY

COAL AGE

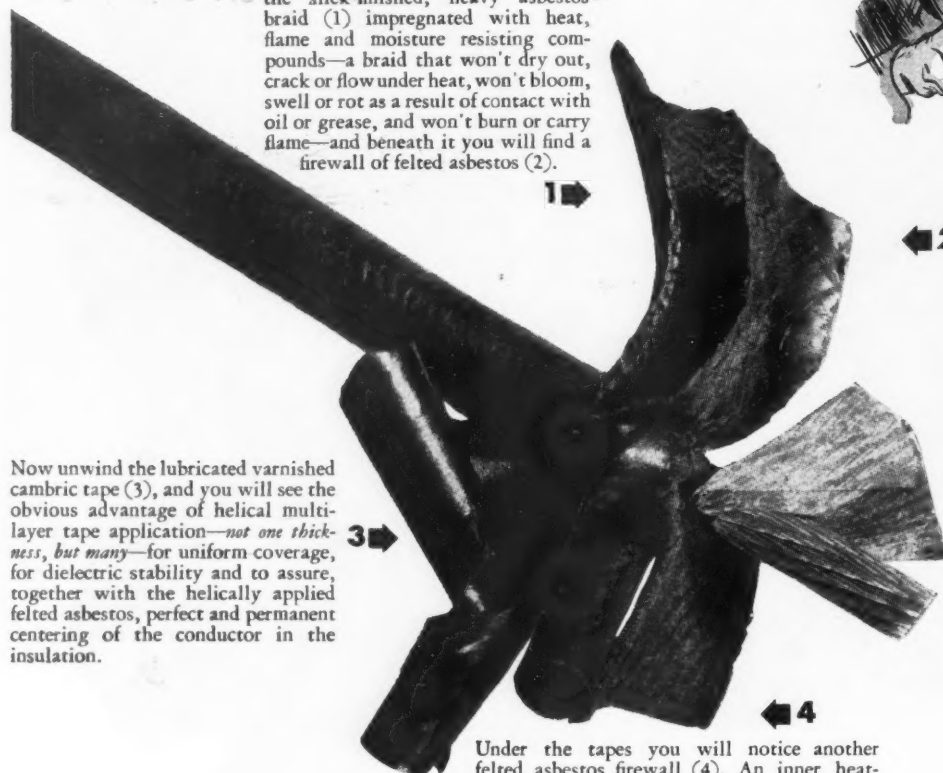
COAL AGE • October, 1943

145

GET THE INSIDE STORY... APPLY THE KNIFE-TEST TO ROCKBESTOS A.V.C.



Take a sample of Rockbestos A.V.C. Mining Cable (illustrated), slit open the slick-finished, heavy asbestos braid (1) impregnated with heat, flame and moisture resisting compounds—a braid that won't dry out, crack or flow under heat, won't bloom, swell or rot as a result of contact with oil or grease, and won't burn or carry flame—and beneath it you will find a firewall of felted asbestos (2).



Now unwind the lubricated varnished cambric tape (3), and you will see the obvious advantage of helical multi-layer tape application—not one thickness, but many—for uniform coverage, for dielectric stability and to assure, together with the helically applied felted asbestos, perfect and permanent centering of the conductor in the insulation.

2 Cut through this felted asbestos firewall (2) also impregnated with heat, flame and moisture resisting compounds to provide a permanent protecting wall against high ambient temperatures that won't bake brittle or crack with vibration, and when you peel it back you will see the high-dielectric, moisture-resistant varnished cambric tape (3) it protects from heat, flame and oxidation.

5 This cigarette-thin layer of paper (5) doesn't look like much but it has an important function. It is employed as a separator to keep insulation and compounds out of the conductor so that it will be clean and easy stripping. And that completes the story of the construction of Rockbestos A.V.C. the cable with permanent insulation.

4 Under the tapes you will notice another felted asbestos firewall (4). An inner heat-barrier to complete the protection of the varnished cambric, put there to prevent conductor-heating overloads from attacking the tapes. It won't ignite or burn even when exposed to copper-melting arcs. Now slit this felted wall and peel it back, and you'll see beneath a thin layer of paper (5) over the conductor.

Try the simple test outlined above on a sample of Rockbestos A.V.C. Mining Cable, which we will send on request, and you'll readily see why *permanently insulated* Rockbestos resists heat, flame, moisture, corrosive fumes, oil and grease—and gives long-lived service under high operating temperatures and severe conditions.

Rockbestos A.V.C. Mining Cable and other Rockbestos A.V.C. Constructions (Underwriters' and

National Electrical Code, Type AVA) have a maximum operating temperature rating of 110° C (230° F), and will not bake brittle, crack, bloom, swell or rot. Send for a sample and make your own jack-knife test. Write to us at New Haven or the nearest branch office:

ROCKBESTOS PRODUCTS CORPORATION
1102 Nicoll St., New Haven, Conn.



ROCKBESTOS A.V.C.

The Cable with Permanent Insulation

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FOR VICTORY—GET OUT COAL and INVEST IN U. S. WAR BONDS

APPLICATION

Mr. JOY MANUFACTURING CO.

Machine 7-BU LOADER

Bearings SKF SELF-ALIGNING BALL



LOADING 4 tons per minute ON SKF BEARINGS

Before the War is won, this Joy 7-BU Loader equipped with SKF Bearings will have moved thousands of tons of coal in seams ranging from 48" or higher in thickness. And it will have loaded coal into the cars at a speed up to four tons per minute. When Victory has finally been achieved, many mine operators will look back with a deep sense of satisfaction and say: "Those Joy loaders certainly went to town when we needed coal so badly for our factories, homes and by-products. Not once did they stop for bearing trouble." Users of SKF-equipped machinery everywhere will say the same thing, for they realize the importance of the high load carrying capacity, self-alignment, freedom from adjustments and many other advantages of SKF Bearings.

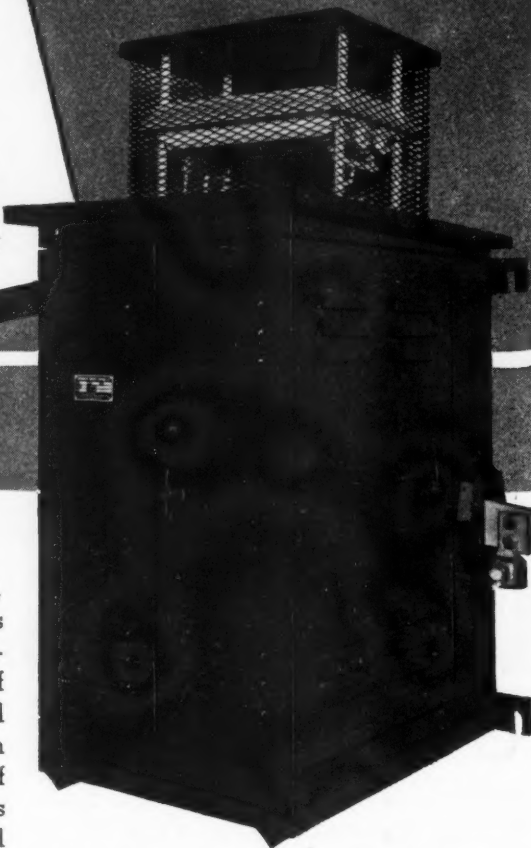
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SKF INDUSTRIES, INC., PHILADELPHIA, PENNA.



D-C SECTIONALIZING

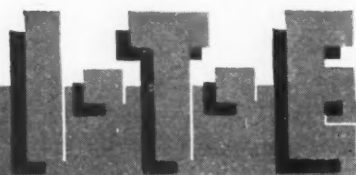
Necessary
FOR PEAK
PRODUCTION



In fifteen years coming up to this war, mining men had many opportunities to observe the advantages of sectionalized d-c systems. Installations of sectionalizing circuit breakers had increased steadily, year by year, in keeping with the rate of adoption of mechanized mining. The advantages of sectionalizing became recognized to the extent that mining men came to think of "mechanizing" and "sectionalizing" as bound together and to plan their mechanized installations accordingly.

But by far the greatest demonstrations of the advantages of d-c sectionalizing have come during this war period. Interruptions in production caused by electrical disturbances have assumed new importance. Means of confining electrical disturbances to small areas have come to be viewed not merely as essential parts of the best, modern practice—*steps to control underground power have become necessary.*

It is the job of Type KSC circuit breakers to aid in reaching and maintaining peak production. The value that mining men place on this equipment is seen in the number of installations completed in the past two years and in the plans which mining men are laying before us for the opening of new areas and the extension of old areas.



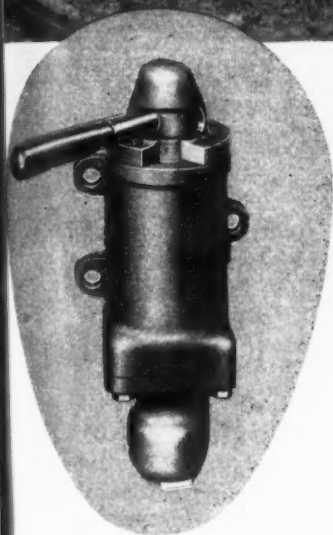
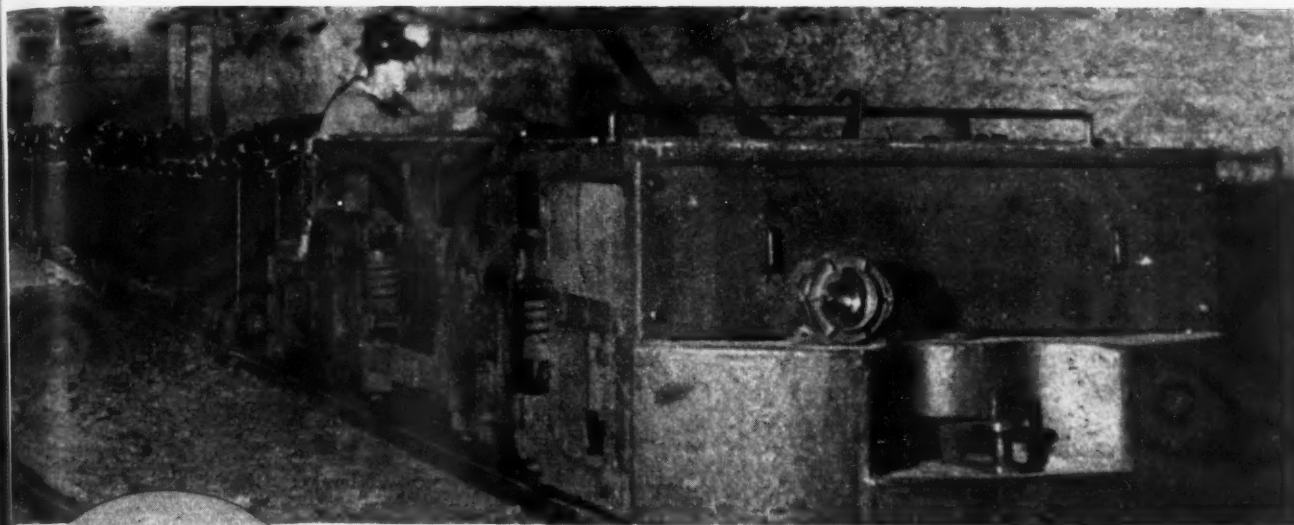
AIR SWITCHGEAR
IMMERSED IN AIR • ENCASED IN STEEL



Representatives in Principal Cities

CIRCUIT BREAKER CO., PHILADELPHIA, PA.

The WESTINGHOUSE *Hydraulic* BRAKE



ITS *Distinctive* OPERATING VALVE (*"Self-Lapping"* Type) Provides...

Simple, effortless manipulation.

Instant response to operator's intent.

Pressure build-up proportional to degree of handle movement.

Prompt, precise graduation on or off.

Desired intensity easily and quickly attained.

Produces the following results: Loading operations are faster ★ Serviceability of existing equipment enhanced ★ More loaded cars kept rolling, more trips made ★ Faster haulage on descending grades, safely ★ Longer life for mechanical elements and electrical apparatus ★ Tandem operation facilitated ★ Tonnage production increased for wartime requirements.

The Westinghouse Hydraulic Brake is a simple, compact system, easily installed on any small locomotive, new or old.



WESTINGHOUSE AIR BRAKE COMPANY
INDUSTRIAL DIVISION » » » PITTSBURGH, PENNA.



Have you ever been out of a job?

What you can do

The best way to insure good jobs and better living is to create an environment favorable to continuous industrial progress.

The best way to insure healthy industrial progress is through a nation-wide understanding of the fact that we live better through doing more work in less time.

Nation-wide understanding of that fact will result in laws that encourage industrial progress.

Nation-wide understanding always will be a will-o-the-wisp, unless each business man does his share of: (1) Understanding his own responsibilities in maintaining industrial progress; (2) Explaining the relation between good business and good living to his employees and neighbors.

The newspaper advertisement reprinted here is McGraw-Hill's share in the job of explaining the source of good living. It has appeared in Washington, New York and Chicago, as well as in all McGraw-Hill publications. It is available, for use over your own company signature, in your plant city. A mat, six-column size for newspaper reproduction, will be sent to you upon request. Booklet reprints are also supplied at cost (\$10.00 per thousand).

James H. McGraw, Jr.
President

McGraw-Hill Publishing Company, Inc.

IF you have ever been out of a job, and if you had a wife, children and slender resources at the time, then the fattest paycheck will never quite obscure the memory of the days and nights you lived with fear.

Some of that fear lingers in every man's mind, for all have suffered in some degree.

► That's why you hear the words "postwar planning" so often. Americans are determined that, one way or another, they are going to keep our thousands of factories going after the war, so that there will never again be a vast army of unemployed.

As usual, in a democracy, there are two entirely different ideas as to how to make 56 million jobs grow after the war, where only 46 million existed before.

Both kinds of people, who hold these different ideas, sincerely want to make the postwar world a better place for you to live in. They have complicated arguments, backed by lots of figures.

But when you trim all the arguments and figures down, you find that one side believes in DIVIDING jobs to make them go round, and the other side believes in MULTIPLYING jobs so there will be greater opportunity for all.

We believe in the MULTIPLYING plan for making postwar jobs and ask you to believe in it too.

Look back over our history. What made us great? Was it rich soil? Africa's is as rich. Was it

FREE MATS: If you would like to publish this message over your own company name, or distribute it in handy booklet form, write or wire: Research Dept., McGraw-Hill Publishing Co., Inc., 330 West 42nd St., New York (18), N.Y.

Have you ever been out of a job? (cont'd)

natural resources? China has them in abundance.

NO, the greatness and the good living of America is the direct product of her genius for doing more work in less time.

Invention is the source of improvement, and *improvement* is the multiplier of jobs . . . when products are improved in service or style, or lowered in price, new customers are attracted and new jobs created.

That's why it is true that good living has its source in industrial progress.

When industrial progress is interrupted, we have a depression, and there is less good living.

When (through courageous investment in new and better products) industrial progress is resumed, we go on to even higher levels of good living.

► If every able-bodied person in America is to have a job, then we must all understand the things that make good living possible, and we must all help *improve* the methods that have given so much good living to so many people already.

For businessmen, that means a constant search for improved methods and machines, a regular year-after-year investment in industrial progress. This means avoidance of such things as speculation in inventories that tend to create booms and depressions rather than consistent progress.

For every citizen, it means a constant search for the best ways and means to prevent and cure depressions.

Businessmen, alone, cannot prevent bad times. It's a job for *every* citizen. Every American can help just by knowing that good living comes from doing more work in less time. If you, and all other Americans, swing on to that fact, the laws that control our rate of industrial progress will be better designed to keep the improvement engine running.

That's where government really can be helpful in postwar planning.

It can encourage the "take a chance" spirit that is the basis of all progress. And it can improve the measures which prevent and cure depression.

At present, our laws are not framed to encourage investment in new and better methods.

Many local, state and national taxes work out in favor of keeping an old machine, instead of buying a new one.

► There are tens of thousands of machines in the country that are over 20 years old. Even our shiny new war equipment is living 3 years in one, and will be old when the war is over.

Every machine should be regarded as obsolete as soon as it is installed and work started on a better one. In the long run, that is the best way to multiply jobs and create better living. Our laws should *encourage* the process, not *discourage* it.

New machines can only be bought with the profits created by old machines. The money that is laid aside by industry to develop and buy new machines is called "Seed Money." If laws take away too much of the Seed Money of business, that will prove disastrous. High taxes must be paid, but they should not destroy Seed Money, which is the only source of improvement.

That's why it's so important for everyone, no matter what his walk in life, to know this fundamental fact:

*"Industrial Progress
is the Source of all Good Living."*

THE MCGRAW-HILL NETWORK OF INDUSTRIAL COMMUNICATION

24 publications, which gather "war-news" from the "war-production-front" through a staff of more than 153 editors and 725 engineer-correspondents . . . More than 1,500,000 executives, designers, production men and distributors use the editorial and advertising pages of these magazines to exchange ideas on war-production problems.

MCGRAW-HILL BOOKS

Publishers of technical, engineering and business books for colleges, schools, and for business and industrial use.

This advertisement is available in handy booklet form. (Less than 100 copies free. Larger quantities, \$1.00 per 100; \$10.00 per 1000.)

McGRAW-HILL

PUBLISHING COMPANY, INC. . . . BOOK COMPANY, INC.

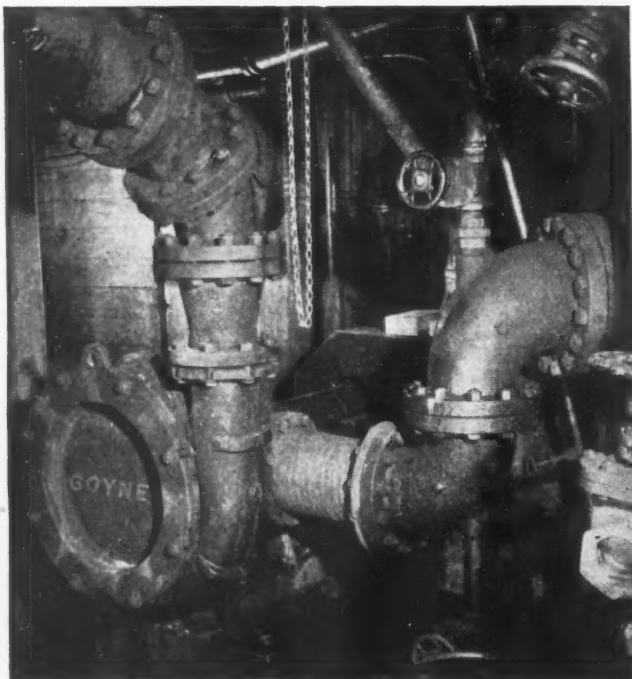
330 WEST 42ND STREET, NEW YORK (18), N. Y.

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GOYNE PROCESS PUMPS



A Sand Pump is only a link in a chain in a coal washing plant, but it can be a strong link if it embodies the following features as does the Goyne:

1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing only the rear head of the pump. No suction or discharge piping is disturbed.
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4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.
5. We carry the spare parts stock. Order your replacements when needed. Reduce your inventory by using Goyne Process Pumps.

All inquiries receive prompt and careful attention.

THE GOYNE STEAM PUMP CO.
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PERFORATED METAL COAL MINING SCREENS

Manufactured exactly to your specifications
Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices.

CHICAGO PERFORATING CO.

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Westco PUMPS
Serve All Industries
Large and Small

There is a size and type of Westco unit to meet important water moving requirements in practically every industry. Among the wide range of Westco equipment, the following are typical:

THE WESTCO UNIBILT PUMP

... an extremely compact, rugged pump for general purpose applications at low and medium heads. Ideal as sump pump, pressure pump, circulating pump, etc., where space is a limitation. Capacities to 100 GPM. Heads to 300 ft. Both self-priming and non-self-priming types.

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... returns condensate to boiler at highest possible temperature, effecting important fuel savings. Automatically compensates for extreme head variations, assuring positive return against fluctuating pressures. Compact, rugged. Sizes to 100,000 sq. ft. of radiation. Pressures to 150 lbs.

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PERFORATED PLATE

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AO GOGGLES HELP KEEP YOUR MEN ON THE JOB



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American Optical Company offers you, through The Mine Safety Appliances Company, a line of goggles

that were designed to protect against every possible eye hazard that your workers face in their different types of jobs. AO Goggles are light-weight, easy to fit and comfortable,—yet sturdily built and equipped with Super Armorplate Lenses for resistance to flying chips.

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Fairbanks Valves are made in bronze and iron, in types and sizes for practically every service.

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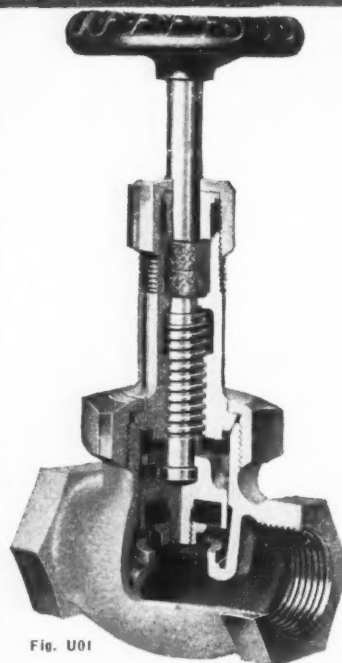
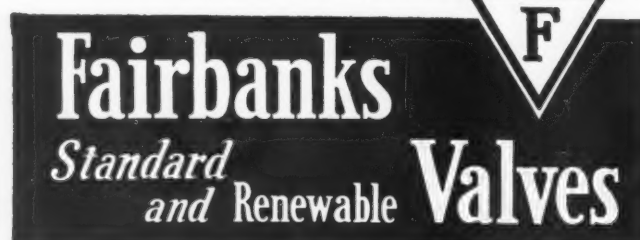


Fig. U01

The greatest help a coal mining man can have—

IF YOU want to make sure of getting your certificate of competency—sure of winning a bigger job with bigger pay, get Beard's great books today and put them to work for you.

In these three books you have a practical, always-on-the-job guide that will help you solve the problems you face every day, show you what to do, tell you why it should be done.

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THESE books explain what a man must know in order to become a mine inspector, a mine foreman, assistant foreman, fireboss, hoisting engineer, safety engineer, shot-firer, etc.

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Can you answer these questions—

What is meant by splitting the air current and what are the advantages derived from such methods?

Can a miner live in air in which the oxygen content is reduced to 17 per cent?

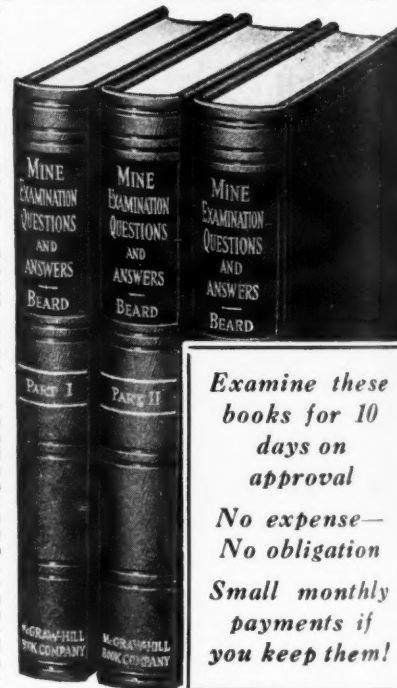
Name five duties imposed on mine foremen by law?

In what time can an engine of 40 effective hp. pump 4,000 cu. ft. of water from a shaft 360 feet deep?

What are the advantages and disadvantages of a gasoline pump, an air pump and an electrical pump?

What is the estimated tonnage per acre, per foot of thickness, for bituminous coal?

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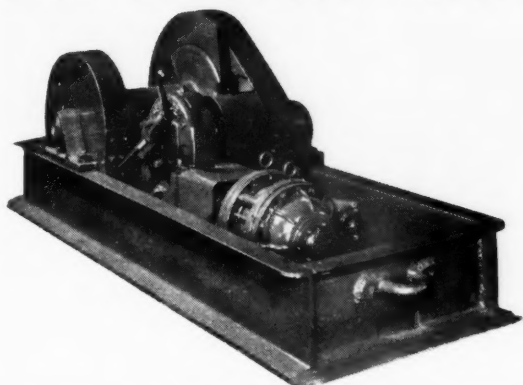
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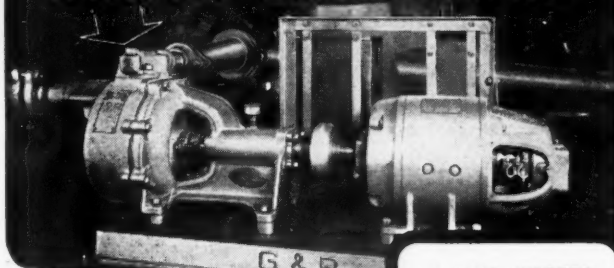
It will pay you to investigate the 6 new features incorporated in the "Flood City" Car Spotting Hoist . . . an entirely new design in which a 30 to 1 worm gear reducer replaces old style cumbersome reduction.

These are the new features: (1) Special Emergency Brake. (2) Any Standard 5 H.P. Motor. (3) Rope pull 6,000 lbs. at 35 ft. per minute. (4) Special Ahlberg Ball Bearings. (5) Sealed-in-oil Reduction Gear Unit. (6) Heavy Channel Iron Frame with turned up ends to facilitate moving.

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FLOOD CITY BRASS & ELECTRIC CO.
JOHNSTOWN, PA.

it PUMPS 24 hours a day with no "shut downs"



The keynote of the dependable G & R Mine Gathering Pumps is the word "simplicity". Because of greater simplicity (only one moving part—the impeller), these Self-Priming Centrifugals will pump more water, more continuous hours, per dollar invested than any other type. No valves to clog; no cylinder liners to be cut out; no gears, cams, levers, etc., to wear, break, or cause trouble. Pumps operate at motor speed. Capacities up to 220 GPM; heads up to 125 ft. Our engineering department will survey your requirements and make recommendations or write for Bulletin MP-2. It's free.

See our catalog data in Coal Mining Catalogs

THE GORMAN-RUPP CO.
MANSFIELD, OHIO

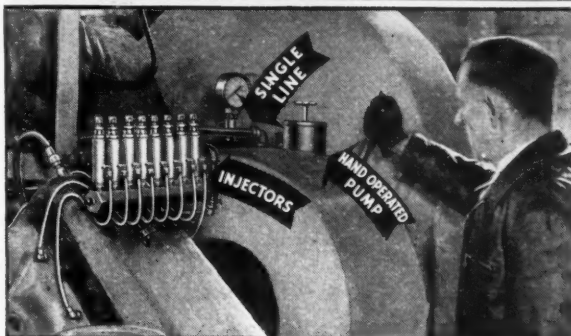
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the Koppers Company are replacing old pumps as they wear out with G & R self-priming centrifugal mine gathering pumps. At the Helen, Stanaford, Kimball, Stotesbury and Koppers Mines 36 G & R Pumps of varying capacities are daily proving their simplicity and dependability.

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Lubricate Mining Machinery While It's Running



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CENTRO-MATIC

LUBRICATING EQUIPMENT

**lubricates all bearings
from a single source**

Avoid bearing failures, cut operating delays and lower your lubrication and maintenance costs by equipping your machines with Lincoln CENTRO-MATIC Lubricating Systems.

A Centro-Matic System consists of a number of Centro-Matic Injectors—one for each bearing—and a power operated or a hand operated Centro-Matic Lubricant Pump. A power operated system can be either time clock control or push button control . . . The injectors can be grouped in manifold or located separately at each bearing. In either arrangement only a single lubricant supply line is required . . . Easily installed on new or old machines.

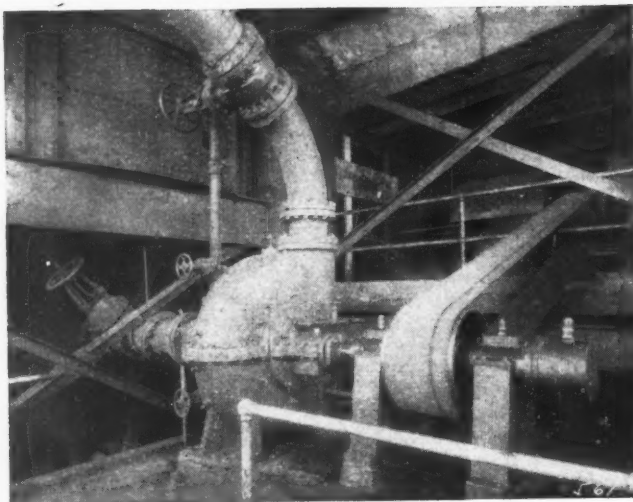
Write for Bulletin 671, and send us blueprints of the machines you plan to lubricate. Our engineers will gladly make recommendations.



The ARMY-NAVY PRODUCTION AWARD for high achievement in the production of war equipment, conferred upon the Lincoln Engineering Company has had a star added. This star symbolizes 6 more months of exacting service to our Armed Forces, delivering vital materials so necessary for ultimate Victory.

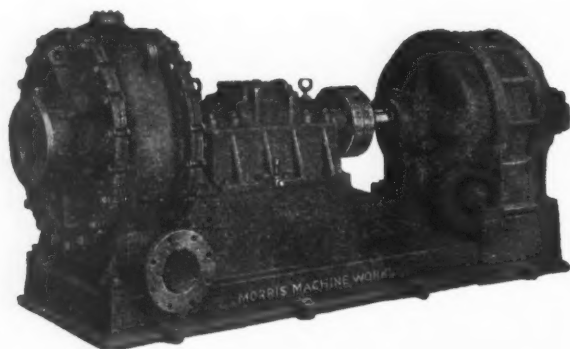
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PIONEER BUILDERS OF LUBRICATING EQUIPMENT
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So wrote an old-time customer when telling us that his 40-year old Morris Centrifugal Pump is still in daily service and too good to be replaced. It may interest you to know this too, for it indicates the stamina that has always been built into every Morris Pump. Whatever may be your pumping requirements, be sure to investigate Morris Pumps—they will give you high efficiencies and long troublefree service. Bulletins on request.



Another Morris Pump type . . . Heavy Duty Material-Handling Pump

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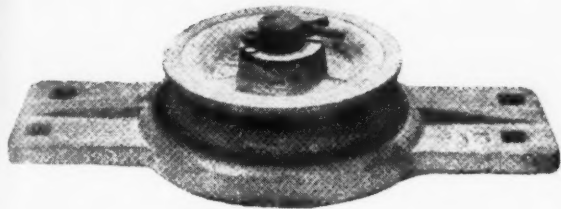


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Shipped on Receipt of Order

This sheave is mounted on a cast iron base 5" wide and 18" long with a hole in each corner to spike to tie or board.

Sheave is 8" in diameter and 2" high and turns on a steel pin 1-1/2" in diameter. Sheave is held in place with a washer and cotter key through top of pin. Weight of sheave and stand is 38 pounds.

We can also furnish this stand with a sheave with an extended flange on top so that hoist ropes which have been tied will pass around this sheave. Weight of this sheave and stand is 53 pounds.

Price of 38 lb. Sheave - \$2.95 Each

Price of 53 lb. Sheave - \$3.35 Each

ROXBURY MACHINE SHOP, Inc.
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It's Surprising How
**THE RIGHT BEARINGS
AND BUSHINGS**
Cut Down Maintenance Cost!

Guaranteed to give service superior to any other bearing metal, or your purchase price, including freight, will be refunded.



Specializing in Bronze Bearings and Bushings for Coal Mining Equipment.

Specific formulae designed to best serve each requirement. **Pioneers in Superior High Lead Bronzes and Alloys.**

Parts for Jeffrey, Goodman, Westinghouse, General Electric, Sullivan, Joy Equipment, etc.

THE AMERICAN CRUCIBLE PRODUCTS CO.
1307 Oberlin Ave., Lorain, Ohio, U. S. A.

Prompt deliveries can usually be made from stocks maintained at

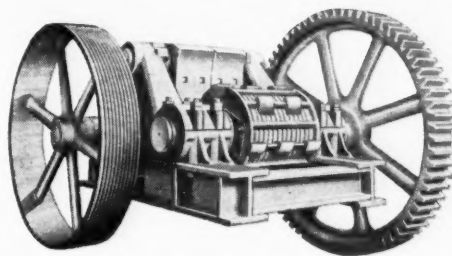
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**CRUSHING ROCK AND COAL
FOR FURTHER PROCESSING...**



McLanahan Rockmaster with Hopper removed.

Where rock and coal are mixed together, the heavy duty all-steel McLanahan ROCKMASTER reduces the formation for further processing and resulting coal economies.

Coal is greatly needed for war production industries . . . investigate the coal savings you can realize with McLanahan all-steel ROCKMASTER CRUSHERS.

McLanahan and Stone Corporation
Pit. Mine and Quarry Equipment Headquarters since 1835
HOLLIDAYSBURG, PENNA.

WOOD PIPE for Mine Drainage

Wyckoff Wood Pipe has an 88 year record of perfect resistance to the corrosive action of sulphurous mine water. It is an ideal, long-time investment—light, easy to lay, and relatively low in first cost.

We also manufacture a special Hard Maple Pipe for flushing culm in the Anthracite Region and wood covering for underground steam lines.



Established
1855

A. WYCKOFF & SON CO.
Office and Factory
No. 35 Home Street, Elmira, N. Y.
The Originators of Machine Made Wood Pipe

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EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RELEASE

UNDISPLAYED RATE:

10 cents a word, minimum charge \$2.00.
(See ¶ on Box Numbers.)
POSITIONS WANTED (full or part-time individual salaried employment only), 1/2 the above rates.
PROPOSALS, 50 cents a line an insertion.

INFORMATION:

BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.
DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

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The advertising rate is \$6.30 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured 1/8 inch vertically on one column, 3 columns—30 inches—to a page. C.A.

NEW ADVERTISEMENTS received by 10 A. M. October 28th will appear in the November issue, subject to limitations of space available.

POSITIONS VACANT

ENGINEER WANTED: with mining experience particularly in coal washing. Nationally-known pump manufacturer has profitable sales territory for practical man around 40. Locate in East. Free to travel. Lack of sales experience will not bar you from consideration. We're looking for an engineer first and will be glad to train the successful applicant. Liberal salary commensurate with man's ability and full opportunity to develop larger earnings in an exclusive territory. In writing give full details. P-233, Coal Age, 16 South Broad St., Philadelphia 2, Penna.

SUPERINTENDENT WANTED to operate small coal mine on the Pacific Coast. Nice location. Party should have experience in steeply pitching seams and crushing ground; also should be a mining engineer with experience in handling men. Correspondence invited. Box 157, Spokane, Wash.

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ENGINEER OR SALESMAN with practical experience in coal, ore, and materials preparation to call on mines and industrial plants, representing a manufacturer of industrial screens. Write full details. SW-235, Coal Age, 330 W. 42nd st., New York 18, N. Y.

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STEEL MANUFACTURER will purchase outright—or manufacture on royalty basis—mining specialty. May also employ patentee or owner for sales promotion. Interested in prompt conclusion of working agreement. Write BO-226, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

EXPERIENCED COAL COMPANY with large dragline strippers interested in strippable coal land which has been proven. Address BO-234, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

FOR SALE

EQUIPMENT FOR SALE—One crawler crane, drag line, 1 1/4 yard. One crawler shovel, 1 1/4 yard. For quick sale. Refer H. C. Hafler, 130 Central Ave., Hasbrouck Heights, N. J. Phone or write.

STRIP MINE MANAGEMENT

Complete management of your strip mine operation is now available from an experienced, capable, and efficient organization. You will be under no obligation to receive detailed information and a survey of your operation, if desired.

SS-227, Coal Age
520 N. Michigan Ave., Chicago 11, Ill.



WE LOOK INTO THE EARTH

By using Diamond Core Drills, We drill for Limestone, Gypsum, Talc, Fire Clay, Coal and all other minerals.

PENNSYLVANIA DRILLING CO.
Drilling Contractors
Pittsburgh, Pa.

DIAMOND CORE DRILLING, for any mineral. More than sixty gasoline, steam and electric drills, suitable for any job. **OUR SPECIALTY**—testing bituminous coal lands. Satisfactory cores guaranteed. Prices very reasonable.

HOFFMAN BROS. DRILLING CO.
PUNXSUTAWNEY, PA. Est. 1902 Tel. 382

MINE CARS

- 500—18" gauge, 3-ton steel mine cars height overall 42" with 18" wheels, end dump type.
- 400—2 1/2-ton, 44" gauge, end dump wood cars, 16" Timken bearing wheels, height overall 36".
- 100—2 1/2-ton, 44" gauge, end dump type steel cars, 23" high, 14" Timken bearing wheels.
- 400—rotary dump steel mine cars, 30" high, 42" gauge, 16" Timken bearing wheels.

LOCOMOTIVES

- 3—10-ton Goodman, type 31-BO1C
- 3—10-ton Westinghouse, type 907-C
- 2—8-ton Goodman, type 132-A-O-4-C
- 3—8-ton General Electric, type HM-819
- 3—8-ton Jeffrey, type MH-100
- 3—6-ton Goodman, type 33-1-A-T-2
- 2—6-ton General Electric Gathering, type HM-823
- 5—6-ton General Electric Gathering, type HM-801

The above locomotives are equipped with 250 volt ball bearing motors, armorplate frame, track gauge from 36" to 48", completely rebuilt and guaranteed.

LOADING MACHINES

- 7—5-BU, Joy, 250 volt DC Shortwall Mining Machines

SHORTWALL MINING MACHINES

- 5—Goodman 112C Universal Permissible Type, 250 volt.
- 6—Sullivan, CE-7, 220/440 volt, like new.

ELECTRIC HOISTS

- 1—800 H.P. Allis-Chalmers, single drum, slope hoist, 7000' of 1 1/4" rope, 3000# rope pull, rope speed 870 FPM, 2300 volt.
- 1—500 H.P. double drum, 1600' of 1 1/4" rope, 2300 volt, Ward-Leonard Control.
- 1—1300 H.P. Shaft Hoist with cylindro-conical drum, 1675' of 1 1/4" rope, 2300 volt.
- 1—1300 H.P. double drum cylindro-conical drum, 900' of 1 1/4" rope, 2300 volt.

COAL MINE EQUIPMENT SALES COMPANY

306-7 BEASLEY BUILDING L.D. Phone-34 Terre Haute, Indiana

COAL MINE HOISTING EQUIPMENT—for sale

HOIST: steam, horizontal engines each 24" bore by 36" stroke, direct connected to single crank shaft carrying six foot diameter drum, grooved for 1 3/4" rope, 180 feet travel. Used operating two cages or skips in balance of 14 tons gross, hoisting distance 160 feet at average speed of 3 dumps per minute in vertical shaft.
HEADFRAME: steel, two compartments 14 feet 10 inches by 7 feet between guides, two six foot diameter sheaves elevated 80 feet above shaft collar and turning iron 43 feet 5 inches above shaft collar.
SKIPS or CAGES: As skips, each has capacity of 3 tons which can be increased. Platform for hoisting men or supplies or coal in cars. Skips permit the use of large capacity drop-bottom mine cars for dumping into bottom bin which is also available.

GREEN RIVER MINE

SOUTH CARROLLTON, KY.

USED COPPER

Large Quantity

300,000 CM Bare Cable
250,000 CM Bare Cable
No. 4 Bare Hard Drawn Wire

Also various other sizes in lesser quantities. Long lengths. Excellent condition. Immediate delivery.

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1 New No. 6-A-19 Argyle Pyropad Sand Dryer complete with protective gratings. Never used. Price \$100.00.

BLACK DIAMOND COAL CO.
INDIANA, PA.

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Steam Driven Air Compressors
Large Steam Pumps
Guaranteed Used Pipe
Steel Buildings
Tanks of all kinds and sizes

Jos. Greenspon's Son Pipe Corp.
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Bucyrus-Erie 1 1/4-yd. gas-air crawler shovel.
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Davenport, Porter & Vulcan steam S/T locomotives, 17-20 tons, 36" gauge, (4). Rebuilt.
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Ryerson-Lennox bevel plate shear, #3, MD.
Fruehauf 50-ton carryall trailer, solids.

H. Y. SMITH CO.

828 N. Broadway Milwaukee 2, Wis.

FOR SALE

4 Storage Battery Motors for haulage locomotives, # 910432, Class G.E. 1027 E-29-W-20 80 volts, amps. 90—R.P.M. 850. Inquire of

HOPCROFT ELECTRIC CO.
Edwardsville, Ill.



FOR IMMEDIATE DELIVERY OF RUBBER PRODUCTS

Conveyor Belting...Transmission
Belting...Elevator Belting...Fire,
Water, Air, Steam, Suction or
Welding Hose, etc.

CALL, WIRE or WRITE
CARLYLE
THE
RUBBER HEADQUARTERS

CARLYLE RUBBER PRODUCTS ARE
NEW, GUARANTEED & LOW PRICED

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers	Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"	20"	5	1/8"	1/32"
42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

Inquire For Prices - Mention Size and Lengths

ENDLESS "V" BELTS

"A" WIDTH All Sizes "D" WIDTH All Sizes
"B" WIDTH All Sizes "E" WIDTH All Sizes
"C" WIDTH All Sizes Sold in Matched Sets
Inquire For Prices - Mention Size and Lengths

PROTECT THAT PLANT

FIRE HOSE

APPROVED SPECIFICATION HOSE EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
2 1/2"	50 feet	\$28.00
	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1 1/2"	50 "	20.00
	25 "	11.00

Specify Thread On Couplings

SPECIAL OFFER... HEAVY DUTY RUBBER HOSE

WATER HOSE

Each Length with Couplings Attached	I.D. Size	Length	per Length
3/4"	25 feet	\$4.25	
1"	25 "	8.00	
1 1/4"	25 "	6.25	
	50 "	12.00	
	35 "	7.50	
	40 "	10.50	
1 1/2"	50 "	12.00	
	25 "	15.00	
	35 "	10.00	
	50 "	14.00	
		20.00	

I.D. Size	Length	per Length	Couplings
1/2"	25 feet	\$5.00	\$1.50 Pair
	50 "	10.00	1.50 "
3/4"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

LARGER SIZES ALSO AVAILABLE
All Prices—Net—F.O.B. New York

CARLYLE RUBBER CO., INC.

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6 YD. or 8 YD.
STRIPPER SHOVEL
225B Bucyrus 80 ft. Boom, 54 ft.
Dipper Stick, Steam Shovel.

2-4 Yds. **SHOVELS**
2 Marion Model, 125. Electric, 35' Boom.
25' Dipper Sticks

DIESEL DRAGLINE
2—52B 2 1/2 Yd. Cap. 80 ft. Boom Diesel
Caterpillar Draglines.
3 Yd. P.H. 800, 97' boom.
2 1/2 Yd. 48B Bucyrus 80' boom.
2—2 1/2 Marion Electric Shovels.
75—1 1/2 & 2 Yd. Dump Cars.

AIR COMPRESSORS:
(7) Steam 66 ft., 300 ft., 600, 1000 & 1940 ft.
(12") Belted, 360, 676, 870, 10000, 1300 ft.
(12) Diesel 105, 315, 520, 676 & 1000 ft.
(6) Electric, 1300, 1500, 2200, 2800, 5000 ft.
(14) Gasoline, 110, 160, 220, 310 & 370 ft.

COAL CRUSHERS:
Jeffrey Single Roll 18x18, 24x34 & 30x30
Link Belt 26x24 Double Roll Crusher
HYDRAULIC CARWHEEL PRESSES:
100 Ton, 150 Ton, 300 Ton, 300 & 400 Ton Cold-
well - Niles - Wood - Watson Stillman

RUBBER CONVEYOR BELTS:
1000' 60", 600' 30", 300' 20", 180' 42", 900' 48",
1450' 36", 1200' 24", 900' 18", 600' 10", 350' 14".

TANKS:
12,000 and 15,000 gal. and 20,000 gal.

CONVEYOR PARTS:
Idlers, Heads & Tail Pulleys, Steel Frames, Trip-
per, etc., 14 in., 60 in. Large stock here.

SYNC. MOTOR GENERATORS & ROTARIES:
100 KW Ridgway 1200 RPM 3/60/2300/250-275
150 KW G.E. 1200 RPM 3/60/2200-250-275
200 KW Ridgway 300 RPM 3/60/2200-250-275
3-100 KW G.E. 275 v. 1200 RPM Rotaries

STORAGE BATTERY LOCOMOTIVES:
2 1/2 ton Witcomb 24 ga. New Batteries

2-4 ton G.E. 30 in. ga.
3-5 ton Mancha 30 in. ga.
4-5 ton G.E. 36 in. ga.
3-7 ton Goodman 36 ga. Battery & Trolley
8-6 ton Baldwin Westgh. 42 ga. & 36 ga.

TROLLEY LOCOMOTIVES:
2 1/2 ton Westinghouse 24 ga.
4-6 ton & 3-5 ton Goodman, 36 ga.
3-6 ton Goodman 30 ga.
4-6 ton Goodman 42 ga.
5-6 ton Westinghouse 42 ga.
2-8 ton Goodman 36 ga.
10 ton Goodman 42 ga. & 13 ton Jeffrey

VIBRATING SCREENS:
9 Tyler Hammer 3x6, 4x5, 4x8 & 4x10
2 Robins Gyrex 4x8 1/2
4x12 Niagara, 3x8 L. B., 5x8 Simplex

CARS:
60—Western 16-20-30 yd. Slide Dump

SHOVELS, CRANES & DRAGLINES:
3 W 90' Boom, 6 & 160' Boom, Model 6150, 175'
Boom, Diesel, Monaghan Walkers
1 yd. K 30 Link Belt 50' Boom Crane
2 yd. Page 70' Boom Diesel Dragline
1 1/2 yd. Marion 450 Elec. Shovel
1 1/2 yd. Lima Diesel Shovel & Dragline
2 yd. Link Belt Elec. Shovel & Dragline
25 ton Browning 50' Boom Loco. Crane

MINE LOADERS:
Junior Joy 36 ga. Low Pan
Conway 20 Mucker
3-5 BU & 7 BU 36 or 42 ga. Joy
6—Goodman 200 & Jeffrey 441
7 Conway 20A, 30A, 50A, 60 & 75 Muckers
MISCELLANEOUS:
15 Ton Plymouth 36 ga. Diesel Locomotive
5'x160' Traylor Rotary Dryer
6—Goodman 12CA & 12DA 6 ft. Cutters
9x8 Sullivan Mine Compressors
Clamshell Buckets 3/4, 1, 1 1/2 & 2 yd. Cap.
30 ton & 12 ton Vulcan Std. Ga. Loco.

WANTED TO BUY:
Complete Mines—M.G. Sets, Locomotives, Com-
pressors, Conveyors, Cranes, Crushers & Rotary
Converters, Also Rails, Screens, Pumps, Cars,
Mine Loaders & Mining Machines.

R. C. STANHOPE, INC.

60 East 42nd St. New York, N. Y.

* MINING EQUIPMENT READY FOR DELIVERY *

CUTTING MACHINES

- 2—28-A Jeffrey, 250 volt
- 2—12-A Goodman, 250 volt
- 1—12-AA Goodman, 250 volt
- 1—29-B Jeffrey, 250 volt
- 1—12-EJ Goodman, 250 volt
- 1—23 Apex Pipe Machine
- 1—26 Apex Pipe Machine
- 2—CE-7 Sullivan, 250 volt
- A. C. Motors for Goodman standard and low
voltage machines

LOCOMOTIVES

- 10-Ton Jeffrey, 250 volt
- 6-Ton Ironton, 250 volt, low vein

Many other items in stock. Let us know your needs—We buy, sell and trade.

ALL-STATE EQUIPMENT CO., INC.

LOGAN, W. Va. PHONE 884

MISCELLANEOUS

- 1—5' x 8' Vibrating Screen
- 1—Figure 8 Rope Drum
- 1—24 x 24" Jeffrey coal crusher
- 2—Cameron Cent. pumps, 650 GPM, 74' head
- 1—Deming Cent. pump, 400 GPM, 70' head
- 1—100 HP Natural Gas engine with 220 volt
generator.
- A. C. Gen. A. C. and D. C. motors, controllers,
compensators

TANKS from Tank Cars

Large quantity

8,000-gallon 10,000-gallon
Built for 60# Hydrostatic and 25# Air Tests.

CLEANED—TESTED—PAINTED

Special Notice: What would PORTABLE
storage of your Liquids save you? Ask
our proposition on WHOLE CARS!

Also TANKS, Commercial, Vertical and
Horizontal

From 2879 to 12,500 gals. and even much larger.

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38 years' experience
13484 S. Brainard Ave., Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"

Prompt Shipment From Our Warehouse

MINING MACHINES

- 2-12 G3 Goodman 220/3/60 AC 6' bar.
- 2-12 AB Goodman 250 v. DC 6' bar.
- 1-35 B Jeffrey 250 v. 6' bar #11416 with cable.

STORAGE BATTERY LOCOMOTIVES

- 5-6 Ton G. E. Permissible Type LSBE Class 2C6 Form C 9 with 2 HM 825 Ball Bearing Motors 1 1/4" armorplate frame 44" Ga. (Can change to 36" Ga. or less) 1—Locomotive equipped with Gould Lead Battery 12 months of original guarantee. 3 Locomotive equipped with Edison Batteries with as much as 72 months in original guarantee. Length 13 1/2' long, 50" high, 69" wide and 44" Wheel Base.
- (Can furnish 150 KW G.E. Syn. M.G. Set, 2200 v. 3 ph. 60 cy. 1200 RPM to charge above batteries.)
- 3-5 Ton Type D Ironton, 36 or 44" Ga.
- 1-5 Ton Ironton Type E2, 36" Ga. with Battery.
- 1-4 Ton Jeffrey 44" Ga. with Battery.

(Haulage)

- 10 Ton Westgh. 250 V. 36" or 40" Ga.
- 8 Ton Westgh. 250 V. 42" Ga.
- 2-5 Ton West. 250 V. 36 or 42" Ga./with Electric Gathering Reels. Bar steel frame.

SCREENS

- 2-4' x 5' single deck Tyler Hummer Screens Type 37 equipped with V-16 Vibrators No. 2860 and 2867 designed for 110 v. AC 15 cy.

MG SETS 3 ph. 60 cy. (Syn.)

- 150 KW Ridgway 250 V. DC 2200 V. AC 900 RPM.
- 150 KW West. 550 V. DC 2200 V. AC 900 RPM.
- 65 KW G.E. 250 V. DC—2200 V. AC 1200 RPM.
- 30 KW West. 250 V. DC—220 V. AC 1150 RPM.
- 22 1/2 KW AL. Ch. 125 V. DC—2200 V. AC 900 RPM.

ROTARY CONVERTERS

- 1-500 KW HCB Gen'l Elec. 275 v. with switchboards and Trans. 6600 or 3500 v. 3 ph. 60 cy.

ENGINE GENERATOR SETS

- 100 KW 250 v. DC Westgh—Skinner Engine.
- 50 KW West. 125 v. DC—Skinner Engine.
- 25 KW Westinghouse 125 v. Steam Turbine.

SLIP RING & SQ. CG MOTORS

(3 ph. 60 cy.)

HP	Make	Speed	Wdg.	Type
700	G.E.	393	S.R.	MT 432
400	West.	500	S.C.	Ca.
200	G.E.	250	S.R.	MT 412
150	G.E.	600	S.R.	IM
125	Al. Ch.	435	S.R.	
100	G.E.	500	S.R.	MI-25 cy.

HIGH TORQUE WOUND ROTOR MOTORS (Wound Rotors)

HP	Make	V	Speed
200 (4)	G.E.	2200	600
150 (3)	G.E.	2200	600

HOISTS

- 75 HP Lidgerwood sgl. fr. drum
- 50 HP Diamond 2 drums same Shaft
- 52 HP American 2 drum, AC Motor
- 30 HP Clyde sgl. drum, AC Motor
- 30 HP Double drum—Tandem
- 15 HP Lidgerwood sgl. dr. AC Motor

400 TRANSFORMERS

(Westgh. & GE 1 ph.)

Qu.	KVA	Pri. V.	Sec. V.
3	1	2080/2200	115/230
5	2	"	"
100	5	"	"
82	7 1/2	"	"
71	10	"	"
2	25	2200	244/488
1	30	2080/2200	115/230
3	37 Rotary	4400/185	
3	37 1/2	2200	220/440
3	50	22000	2200
3	75	2200	110/220
3	100 Uptegraft	400	220

D. C. MOTORS

- 125 HP General Electric 230 V. 750 RPM.

MOORHEAD-REITMEYER CO., INC.

PITTSBURGH, PENNSYLVANIA

COAL CUTTING MACHINES

- 1-35B Jeffrey 250 volt Shortwall.
- 1-35B Jeffrey 500 volt Shortwall.
- 1-212AA Goodman Low-vein 210 volt Shortwall.
- 1-212AA Goodman Low-vein 500 volt Shortwall.
- 1-29LE Jeffrey T.O.H. Arcwall Permissible.
- 1-12DA Goodman, 50 HP, 210 volt.
- 1-12A Goodman, 500 volt Shortwall.
- 1-12G3 Goodman AC Shortwall, 3/60/220-440 volt.

LOCOMOTIVES

- 1-13 Ton G. E. with HM-829 250 V. Motors.
- 1-10 Ton G. E. with HM-830 250 V. Motors.
- 1-8 Ton G. E. with HM-839 250 V. Motors, and reel.
- 2-6 Ton Jeffrey with MH-88 250 V. Motors and reels.
- 1-6 Ton G. E. with HM-819 250 V. Motors.

ELECTRIC MOTORS

- 1-165 HP G. E. Syn. Motor, 3/60/2200 or 500 V. 900 RPM.
- 1-100 HP Crocker Wheeler Syn. Motor, 3/60/220 V. 1200 RPM.
- 2-50 HP G. E. Slip Ring Motors, 3/60/440 V. 600 RPM.
- 1-100 HP West. Type CW Slip Ring Hoist Motor, 3/60/2200 V. 720 RPM.
- 3-150 KVA Pittsburgh Transformers, 6600-220/440 V.
- 3-100 KVA G. E. Transformers, 13,200/6600/2200-220/440 V.
- 3-30 KVA West. 2200-110/220 V.
- 1-25 HP West. Type HK, 250 V. Series Wound Hoist Motor, 600 RPM.

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3530 Forbes St. Pittsburgh, Pa.

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AC & DC

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Top Grade Relay Rails For Mine Tracks

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- Angle splice bars to match.
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RELAYING RAILS—Super-quality machine-reconditioned—not ordinary Relayers.
NEW RAILS, Angle and Splice Bars, Bolts, Nuts, Spikes, Frogs, Switches, Tie Plates, and all other Track Accessories.

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PITTSBURGH NEW YORK CHICAGO

FOR SALE

- 1—One NORDBERG Hoist No. 06392, 4 ft. drum, hydraulic brake direct connected 150 h.p., G.E. motor AC, 440 v. 3 ph. 60 cycle, speed 585, complete with panel board and ammeter.
- 3—One POMONA Vertical Pump, 75 h.p., AC, 250 v. 60 cy. 3 ph. Westinghouse motor, together with starting compensator, capacity 1000 gal. per min., 200 feet head.
- 4—One ALLIS CHALMERS Pump, type BS 13406, 100 h.p., motor AC, 220 v. 60 cy., 3 ph., capacity 1000 gal. per min., 250 feet head.

All of the above equipment in first class operating condition

FS-200, Coal Age

520 No. Michigan Ave., Chicago, Ill.

COMPLETE

POWER PLANT

FOR SALE

Now in operation,
Available upon 20-day Notice

PRICE \$6,000

- 1—Harrisburg Standard 15x8 Steam Engine Direct Connected to a 100 KW 220-250 DC Bullock Generator.
- 1-125 Horse Power Houston Standard & Gamble Steam Boiler.
- 1—Large boiler steel water tank. Boiler feed pump, Jet, Switchboard & other items to make power plant complete.

McDONALD COAL CO.

BEATTYVILLE, KY.

REBUILT EQUIPMENT—READY TO SHIP

Mining Machines—250 v. DC

- 1—CE-7 Sullivan 36" gauge
- 1—CE-9 Sullivan
- 1—7 A.U. Sullivan Track Mt'd. 550 v. DC
- 2—Sullivan 51B Buddy Mining Machines 230 v. DC 5" bar, 2 1/2" kerf, with extra armature and parts

MINE LOCOMOTIVES

- 2—3 1/2 ton Iron-ton Battery 36" ga.
- 1—6 ton Atlas 4000# D.B.P. with AC or DC Motors 36" ga.
- 1—10 ton Milwaukee Gasoline
- 1—15 ton Westinghouse, 500 v. DC 40" ga., #158 motors

ROTARY CONVERTERS

- 1—500 kw. G.E. type HC-28, 400 volt, 900 rpm. complete with transformers and switchboards
- 200 kw. G.E. 275 v. DC 900 rpm complete with transformers

HOISTS

- 100 HP. Lidgerwood 2 drum AC or DC Motor
- 1—Lidgerwood Single Drum, holds 9000 ft. 1" rope complete with 225 HP G.E. Motor

CENTRIFUGAL PUMPS

- 2—100 G.P.M. Cameron bronze, 100" hd. 8 x 8
- 1—300 G.P.M. Weinman 90" hd. 6 x 5
- 2—160 G.P.M. Deming Triplex 150# 335' hd. 6 x 8
- 1—Sterling Portable Gasoline driven

AIR COMPRESSORS

- 2—677 CFM. National Brake 2 stage 100 lb. pres. with 150 HP Westinghouse AC Syn. Motors complete

TRANSFORMERS—1 ph. 60 cy.

No. Kva.	Pri.	Sec.	Make
1 250	2300	460	G.E.
1 100	2200	110/220	G.E.
3 100	6600	550/440/220	Pgh.
3 50	11430/6600	550	Al. Ch.
3 50	6600	575	G. E.
1 37 1/2	2300	220/440	Wagner
3 37	4400	185	West.(Rotary)
1 30	2200	110/220	G. E.
2 30	440	220/110	West.
35 10	2200	110/220	G. E.
100 7 1/2	2200	110/220	G. E.
75 5	2200	110/220	West.

DIESEL ENGINE SET

- 1—217 KVA G.E. 2300/220/440 v. 3 ph. 60 cy. rpm. dir. con. to 260 HP Buckeye horiz. 2 cyl. Diesel

SLIPRING MOTORS—3 ph. 60 cy.

HP	Make	Type	Volts	RPM
1500	Westg.	CW	2200	435
700	G. E.	MT-432	2200	393
400	Westg.	CW	440/220	1170
300	Westg.	CW-1106	2200	580
300	W. El.	I-12	440/220	600
250	Westg.	CW	2200	345
100	G. E.	I	220	450
100	Westg.	CI	220/440	1750
75	Cr. Wh.		220/440	875
60	Triumph	C-16	220/440	430
60	Westg.	HF	2200	690
53	G. E.	I	220/550	1165

230 V. DC MOTORS

HP	Make	RPM	Type
20	Westg.	575	S
25	Triumph	1750	—
25	Dukane	1150	NS-205
25	G. E.	775	DLC-202
25	Western Elec.	730	ELC
25	Westg.	1300	S
30	Westg.	1150	SK-110L
30	Bullock	850	—
35	Westg.	575	S-10
35	Westg.	950	S
35	Westg.	675	SK-140
35	Westg.	675	SK
125	Morg. Gardner	425	—
150	G. E.	500	MPC-6
150	Cr. Wheeler	625	CCD
200	Cr. Wh.	477	CCD
250	Cr. Wheeler	200/400	CMC
300	Otis	550	—

(With spare armature)

SCALES

- 9—Howe No. 2784, 3 beams (2 at 200 lbs.—1 at 50 lbs.) Platform 14 1/2 x 22", cap. 500#

DUQUESNE ELECTRIC & MFG. . . . PITTSBURGH (6), PA.

FOR SALE

- 1 MOGUL 56-Ton Locomotive and tender in good condition, located at Romulus, N. Y.
- 6 Reconditioned standard gauge flat cars, meeting railroad specifications 9'8" x 36'10" 60,000 lbs. capacity, cast iron trucks
- 1 Rogers heavy duty trailer 19' x 10' body 20" high with Mack Truck Tractor.

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Bound Brook New Jersey

HOIST

- 1—Ottumwa double drum, single gear reduction Electric Shaft Hoist, complete, in first-class condition, with 60 horsepower, 600 revolution, 220 volt, 3 phase, 60 cycle, General Electric motor.

LESLIE E. BRYANT
Clarksville, Arkansas

MINE HOISTS

- 1—Ottumwa 18" Band friction will coil 2000 ft. 3/4" rope 35 or 50 HP motor.
- 1—Vulcan 30" Band friction will coil 3000 3/4" rope 50 or 60 HP motor.
- 1—Connellsville 54" Band friction will coil 5000 ft. 7/8" rope 100 or 150 HP motor.
- 1—Lidgerwood 60" Band friction will coil 6500 ft. 1 1/8" rope with 200 to 350 HP motor.
- 1—Vulcan 60" Sliding pinion will coil 3500 ft. 1 1/8" rope, 200 HP motor.
- 1—Lidgerwood-Cylindro Conical Shaft Hoist—225 ft. 1 1/4" rope, 300 HP motor.
- 1—Vulcan-Cylindro Conical Shaft Hoist 350' 1 3/8" rope, 400 HP motor.
- 1—Connellsville-Cylindro Conical Shaft Hoist 350' 1 1/2" rope, 800 HP motor.

And other hoists to
suit all mining conditions

Jones Mining Equipment Co.

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ROTARY CONVERTERS

- 500 KW G.E. SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM. Pedestal Type, 2300/4000 V. Transformers.
- 500 KW AL-CH SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM. Pedestal Type, 2300/4000 V. Transformers.
- 500 KW WEST. SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM. Pedestal Type, 2300/4000 V. Transformers.
- 300 KW G.E. SYN. 575 V. HCC, 6 Ph., 60 Cy., 1200 RPM. form P, 2300/4000 V. Transformers.
- 200 KW AL-CH SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM. Pedestal Type, 2300/4000 V. Transformers.
- 150 KW G.E. SYN. 275 V. HCC, 6 Ph., 60 Cy., 1200 RPM. form P, 2300/4000 V. Transformers.

MOTOR GENERATORS

- 300 KW WEST. SYN. 275 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM. Manual Switchgear.
- 300 KW RIDGWAY SYN., 275 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM. Manual Switchgear.
- 200 KW G.E. IND., 600 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM. Manual Switchgear.
- 200 KW R.W. SYN., 275 V., 2300/4000 V., 3 Ph., 60 Cy., 900 RPM, 80% P.F. Manual Switchgear.

LOCOMOTIVES

- 13-T WESTGHE, 500 V., 908-C Mts., 36"-44" Ga.
- 13-T WESTGHE, 250 V., 908-C Mts., 36"-44" Ga.
- 10-T WESTGHE, 250 V., 907-C Mts., 36"-44" Ga.
- 10-T WESTGHE, 500 V., 907-C Mts., 36"-44" Ga.
- 8-T JEFFREY, 250 V., MH-85 Mts., 24"-36" Ga.
- 8-T WESTGHE, 250 V., 906-C Mts., 36"-44" Ga.
- 8-T WESTGHE, 500 V., 906-C Mts., 36"-44" Ga.
- 8-T GOODMAN, 250 V., 132-A Mts., 36"-44" Ga.
- 6-T WESTGHE, 250 V., 904-C Mts., 36"-44" Ga.
- 4-T WESTGHE, 250 V., 902-C Mts., 36" Ga.

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AIR COMPRESSORS—DIESELS—PUMPS

Some Steam Engines and Boilers available only slightly above the metal price

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Near Toledo

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- 1—200 KW, G.E. Rotary Converter.
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- 3—165 KVA, G.E. Rotary Transformers.
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- Power & Distribution Transformers.
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- Westinghouse Auto-Rotary Brush Raising Device.
- G.E. Rotary S/R Contactor Panel.

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Norwood, Ohio

FOR SALE

ODD LOT OF NEW CAST IRON PIPE

- 1 Piece 6" B&S Class A 16' lengths
- 4 Pieces 6" B&S Class A 18' lengths
- 1 Piece 7" B&S Class A 9' lengths
- 2 Pieces 10" B&S Class A 18' lengths
- 1 Piece 12" B&S Class A 12' lengths
- 8 Pieces 14" B&S Class B 18' lengths
- 13 Pieces 18" B&S Class B 18' lengths

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HEAVY EQUIPMENT

**CARS — CRANES — COMPRESSORS
DRAGLINES — LOCOMOTIVES
SHOVELS—TRACTORS—ETC.**

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WE WILL FIGURE WITH YOU ON
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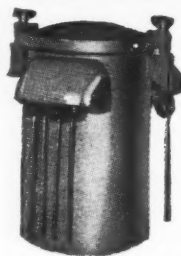
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4—Jeffrey Longwall Type
Serial Nos. 16995-6-7-8.
Model 24-B Year 1935.

1—Sullivan Longwall Type.
Serial Number 11086.

Clonick Steel Co.
2375 S. Archer Chicago, Ill.

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SPECIAL

KUHLMAN ELECTRIC FURNACE TRANSFORMER

1000 KVA, 3-phase, 60 cycle, 7200—124/72/55 Volts,
available for immediate shipment

Price quoted on request

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"AMERICA'S USED TRANSFORMER CLEARING HOUSE"
STATION M SINCE 1912 CINCINNATI 27, OHIO

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CONSTRUCTION & CONTRACTOR'S EQUIPMENT

- 1—FE 80 Caterpillar Diesel Tractor
 - 1—RD 7 Caterpillar Diesel Tractor with LeTourneau Bulldozer
 - 1—RD 7 Caterpillar Diesel Tractor with double drum hoist
 - 1—RD 7 Caterpillar Diesel Tractor with ATHEY Bulldozer
 - 1—Model 75 Caterpillar Diesel Tractor with push plate
 - 1—Model 80 Caterpillar Diesel Tractor with Le-Plant Choate Bulldozer
 - 1—Model 70 Caterpillar Gas Tractor
 - 1—Model 60 Caterpillar Gas Tractor with LeTourneau Bulldozer
 - 2—Model "L-15" Gar Wood Scrapers
 - 2—Model "J-12" LeTourneau Scrapers
 - 1—Model "JR-4" LeTourneau Scraper
 - 2—12-yd. Austin Western Hydraulic Scrapers
 - 2—12-yd. LeTourneau Scrapers
 - 2—18-yd. LeTourneau Scrapers
 - 1—48" Caterpillar Elevating Grader
 - 8—Rills Chalmers Speedace Tractor Wagons
 - 2—WD 10 Cat. Wagons
 - 5—8-yd. Euclid Trunk Truck Hauling Units
- IRON & STEEL PRODUCTS, INC.**
13484 S. Brainard Ave., Chicago, Illinois
"Anything containing IRON or STEEL"

WANTED

Double-Ended Lathe suitable for turning Mine Locomotive wheels from 18" to 36" diameter on thread. State make, condition and price.
200-ton Hydraulic Wheel Press suitable for pressing—off Mine Locomotive wheels. State make, condition and price.

W-232 Coal Age
330 West 42nd St., New York 18, N. Y.

Wanted Joy Mine Loaders

Size 5 BU—7 BU—8 BU—12 BU—14 BU.
With AC motors, caterpillar mounted and car wheels adjustable 36" to 42" gauge.
150 KW motor generator set.

J. C. SFALY
1004 Salem Avenue, Hillside, New Jersey

WANTED

Shovels— $\frac{3}{4}$ to $2\frac{1}{2}$ yards.
Draglines— $1\frac{1}{2}$ to 6 yards.

FRANK SWABB EQUIPMENT COMPANY
HAZLETON, PA.
Telephone 3906

New "SEARCHLIGHT" Advertisements

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330 West 42nd Street • New York 18, N. Y.

SEARCHLIGHT (Classified Advertising)

SECTIONS

are found in these

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Electrical Contracting
Electrical Merchandising
Electrical World
Electronics
Engineering & Mining Journal
Engineering News-Record
E. & M. J. Markets
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Power
Product Engineering
Textile World



SEARCHLIGHT SECTION



LOCOMOTIVES

Goodman: All 250 volts.
1—10 ton, 31-1-4-T.
1—6 ton, 30B, 48" 1—5 ton.
1—5 ton, W-1-2, 36".
1—4 ton, 8-30.

Westinghouse: All 250 volt.
1—4 ton, 902, 48" 1—18 ton, 102, 42"
1—904 c 44" 500 volt. Also 906 motors.
1—10 ton, 915.

G.E.: All 250 volt.
4 ton 1022, 41, as is
6 ton 803, 44", as is 5 ton 825, 44"
6 ton 823, 44" 8 ton 839 motors
6 ton 801
8 ton 839

Jeffrey: 6 ton, and 4 ton, all gauges, 250 volt
1—Jeffrey MH 110 Locomotives
1—Jeffrey MH 100

AERIAL TRAMWAYS * HOISTS * PUMPS * MOTORS * TRANSFORMERS * BOND WELDERS * RESISTANCE * COMPRESSORS * DUMPS * SPEED REDUCERS
FIELD FRAMES * ARMATURES * GOODMAN HYDRAULIC SHOVELS * MOTOR STARTERS AND CONTROLS * AC & DC * DROP BAR SUPPORTS (Goose-
neck), 29B and 29C * MINING MACHINE TRUCKS * SWITCHBOARDS * CIRCUIT BREAKERS—AC & DC * CONVEYOR HOISTS * COAL CRUSHERS (double
roll) 12"x16", single roll 24"x36", 30"x30", 24"x24" and 18"x16" * TURBO-GENERATOR 500 K.W. 275 volt DC * ROPE & BUTTON CONVEYOR 400' long LATHES,
SHAPERS * SWITCHES * AUTOMATIC CIRCUIT BREAKERS 250 volt 600 amps to 2000 amps * MANUAL CIRCUIT BREAKERS 600 amps to 3000 amps * HOISTS,
overhead, AC, 3-60-440, 1 ton and 2 ton * CAR RETARDERS, Fairmont * 1 Clam shell bucket 1 1/2 cubic yard. * Figure 8 drum * MINE CARS Solid, 22" high with
rotary dump, 44" gauge * 2 SULLIVAN BIT SHARPENERS * R.R. SWITCHES 85# to 100# HOISTS 5 HP AC and DC GENERATORS DC 250-275 volt, 30 KW
to 100 KW.

MINING MACHINES

Jeffrey, 35B, 29B, and 4—28A, 250 V. 2—
29C with drop bar support.

Goodman, 12A, 12AB, 12AA, 12G3A, 34B.
1—12C3 250 volt and 2—112 DA, 500 volt.
2—Permissible Type 12CA. 6—112AA,
3—124AA.

Sullivan, CE7, CE9, CE10, CR10 Low Vein.

SUBSTATIONS—275 volts, D. C.

2—200 KW G.E. Rotaries (600 volt)
1—200 KW Ridgeway M-G Set.
1—200 KW G.E. Rotary Converter.
1—200 KW West. Rotary.
1—150 KW West. Rotary.
1—200 KW, 1—100 K Ridgeway M-G Sets.
1—150 KW Ridgeway Rotary.
1—150 KW West. Rotary converter.
1—100 KW West. M-G Sets.
1—90 KW G.E. Rotary.

SPARE ARMATURES

Jeffrey MH 110, MH 78, MH 73, MH
88, 29B, 35B and 28A. Goodman
34B, 30B, 30C, 12A, 12AB, 12AA,
33-1-4-T, 31-1-4-T. General Electric
801, 803, 819, 821, 825, 839. Westing-
house 904, 906, 102, 907, YR2, 115.
Also 200 KW Westinghouse Rotary
Converter Armature, 250 V. Bracket
Type, 150 KW G. E. HCC Bracket
Type, and 150 KW G. E. TC Ped-
estal Type.

GUYAN MACHINERY COMPANY, Logan, W. Va.

MACHINE TOOLS

Lathes, Shapers, Milling Machines, Saws
etc. for general maintenance work. We
have a knowledge of the shop problems
of the mine shop. Write or wire us your
inquiries.

Cincinnati Machinery & Supply Co.
217 E. Second St. Cincinnati, Ohio

NEW and REBUILT STORAGE BATTERY

LOCOMOTIVES

1 1/2 to 10 Ton—18" to 56" Track Gauge

GREENSBURG MACHINE CO.
Greensburg, Penna.

FOR SALE

Fairbanks Morse Railroad Track Scale

\$5,500.00—Like new
Answer c/o P. O. Box #326
Pittston, Pennsylvania

For Sale—MINE CARS

30 wood mine cars: Gauge 36", Capacity 2 tons.
Inside Length 7' 9", Depth 27", Width 60".
Height above rails 36". Wheels 16". Alenite fit-
tings. Swivel Couplings. All bumpers, draw bars
and door latches good. 3" channels around top of
most cars. Also 20 extra swivel couplings 1 1/2"
steel. These cars in first class condition and ready
for service.

FRANKLIN COAL MINING COMPANY
Birmingham 3, Alabama

FOR SALE

5 Goodman automatic Duckbills, Type
A-1-G. In very good condition.

NEWPORT COAL COMPANY
UHRICHSVILLE OHIO

FREIGHT CARS for INDUSTRIAL SERVICE

50—Hopper, Double, 50-Ton
45—Hopper Side-Discharge, 50-Ton
30—Ballast, Composite, 50-Ton
50—Box, 36-Ft., 40-Ton; Steel Ends
16—Refrigerator, 36-Ft., 30-Ton
50—Refrigerator, 40-Ft., 40-Ton
75—Gondola, Composite, 36-Ft. & 40-Ft.,
40-Ton
1—Dump, K&J, Automatic, 16-Yd., 30-
Ton
16—Dump, K&J, Automatic, 20-Yd., 40-
Ton
2—Dump, Western, Automatic, 20-Yd.,
40-Ton
150—Tank, 8000-Gallon, 40 and 50-Ton

Locomotives and Passenger Cars too!

IRON & STEEL PRODUCTS, INC.

38 years' experience

13484 S. Brainerd Ave.

Chicago 33, Illinois

"ANYTHING" containing IRON or STEEL"

Mining Locomotives

4—Westinghouse 905-C, 7 ton each or 14 ton op-
erated in tandem, trolley type
1—Westinghouse 12 ton, serial 32729
1—Westinghouse 8 ton, serial 23352 with 905-C
armature
1—Jeffrey 10 ton, serial 1875 with MH 73 arma-
ture

Will convert to any desired gauge, also voltage.
Also available Rock Duster, single drum hoist,
2 yard Owen clamshell bucket and portable electric
compressor.

ALLSTATES EQUIPMENT CO.

343 S. Dearborn St. Chicago, Ill.
Phone: Harrison 7784

CURRENT SPECIALS

Two—Ironton type WOD double motored
42" ga combination battery-trolley loco-
motives (without batteries). GE 80 volt
ball bearing motors, worm & worm gear
drive, ball bearing trucks. Good used
condition. Price subject inspection and
prior sale, \$1125.00 each.

Two—Mansha single motored 36" ga bat-
tery locomotives (without batteries). As
is, subject inspection and prior sale,
\$600.00 each.

One—Sullivan C67 mining machine, 3-60-
220 volt, tip turn truck, cable etc.—
Subject inspection and prior sale,
\$1050.00.

One—Sullivan bit sharpener complete
with motor and heating forge. Subject
inspection and prior sale, \$525.00.

One—100 KW Allis-Chalmers rotary con-
verter, with three 40 KVA transform-
ers, HV 6900 LV 185-92.5. As is, subject
inspection and prior sale, \$1350.00.

Two—562 KW Allis-Chalmers turbo-gen-
erators, 3 phase 60 cycle 2300 volt, com-
plete with condensers, piping, valves,
wiring and switchboards. Price, \$10,-
000.00 per unit, subject inspection and
prior sale.

One—General Electric-Lidgerwood 300 HP
3 ph 60 cy 2200 volt Mine Hoist, Serial
No. 5169, motor serial No. 4013180. Com-
plete with magnetic controller conical
step-up drum, air brake, etc. Has had
little use. Price \$8250—subject inspec-
tion and prior sale.

HAIR EQUIPMENT COMPANY

Office and Warehouse
Reed and Election Streets
BENTON, ILLINOIS

Complete Catalog on Request

LIQUIDATION

150-ton BLAST FURNACE

And Accessories

Inspection and shipping point;
NASHVILLE, TENN.

1—Complete BRIQUETTING UNIT, including
1-Komarek-Greaves Press, making 360-2"
square by 1 1/4" thick Briquettes per rev.,
Max. speed 11.3 RPM. Also, one K-G Pug
Mill Mixer and one Briquette Dryer Con-
veyor, 134' c.c., to handle approximately
25 tons per hour.

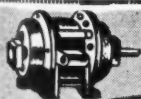
5—Skip HOISTS, steam and electric, single
and double drum.

Miscellaneous: Motors, Conveyors, Hammer Mill,
Pneumatic Conveying System, Turbo Blower, Blow-
ing Engines, Large quantity of spare parts.

Send for Printed Circular Arrange to inspect.

CONSOLIDATED PRODUCTS CO., INC.

13-21 Park Row New York City



WE BUY & SELL
MOTORS
TRANSFORMERS
MOTOR GEN. SETS
OIL SWITCHES
AIR CIRCUIT BREAKERS

ELECTRIC EQUIPMENT CO.
63 Curlew St., Rochester, N.Y.
Tel: Glenwood 6783



30 x 30 Jeffrey Single Roll Crusher
150 Ton—Fairbanks R. R. Track Scale
150 Ton—Niles Wheel Press
300 Ton—Caldwell Wheel Press
62 KW—Engine Generator Unit—250
Volts
125 KW—Engine Generator Unit—250
Volts

Arthur S. Partridge

St. Louis 415 Pine

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Complete Coal Tipples and Coal Handling Equipment

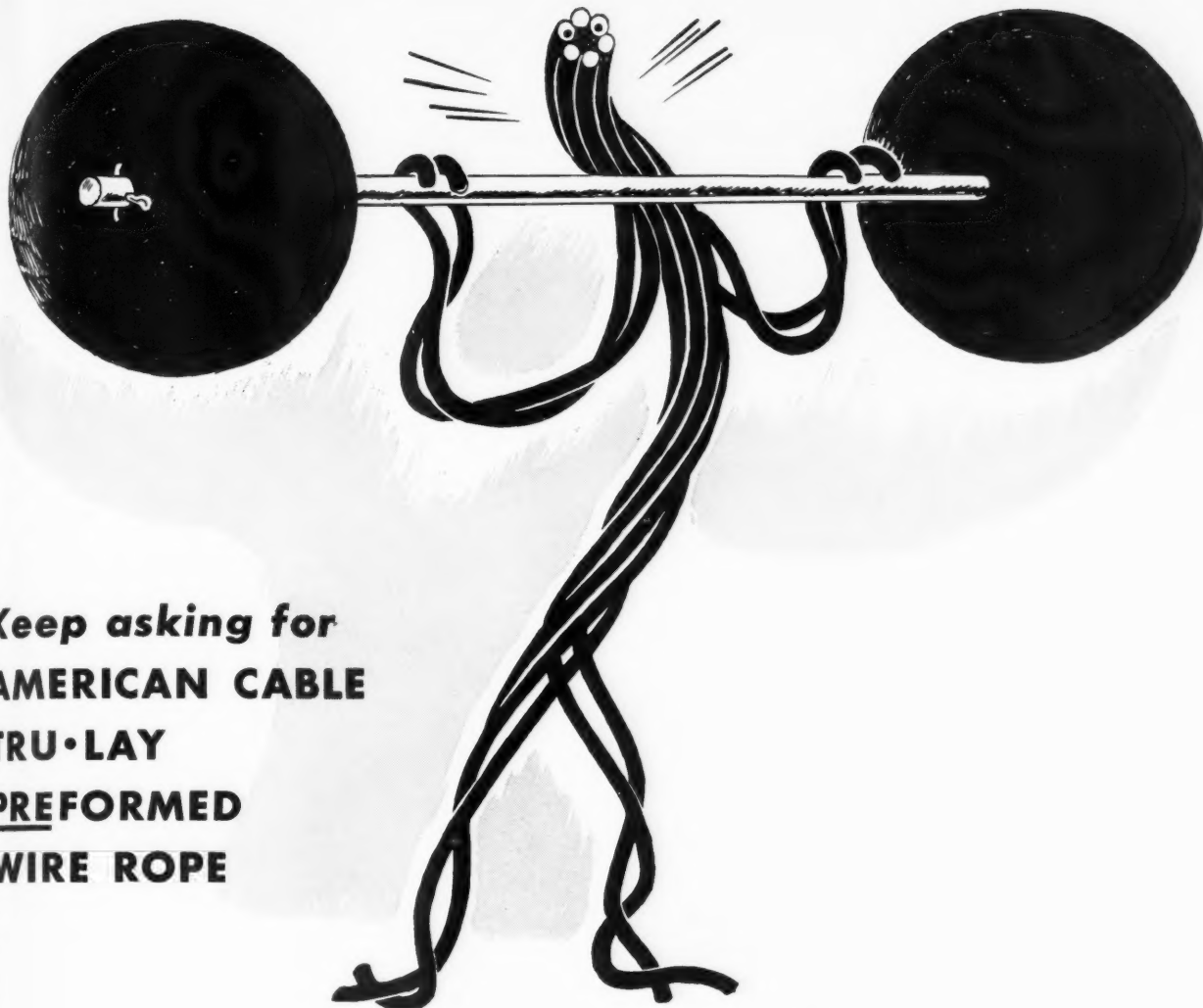
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DESIGNERS AND BUILDERS OF COAL HANDLING EQUIPMENT FOR OVER 25 YEARS

Shaking Screens
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Car Hauls, Picking Tables
Loading Booms, Loading Chutes
Bins, Bin Gates
Car Retarders
Settling Tank, Grizzlies

Revolving Screens
Perforated Metal Screens
Flanged Lip Screen Plates
Elevating and Conveying Machinery
Sand and Gravel Screening and Washing Machinery



**Keep asking for
AMERICAN CABLE
TRU-LAY
PREFORMED
WIRE ROPE**

• American Cable's preforming process preshapes every wire in a TRU-LAY wire rope to its final helical contour. It puts every strand under exactly the same tension. • When TRU-LAY is installed and the load applied, each strand settles down to work carrying an equal share of the load, bearing with equal pressure against the core. This makes American Cable TRU-LAY Preformed wire rope immune to the development of high and low strands which are common occurrences with non-preformed wire ropes. • This is only one of the many advantages you gain when you specify American Cable TRU-LAY Preformed wire rope. It steadies your machine production; saves you time, accidents, and money.

Because . . .
**it has strands that
bear the load equally**

*No wonder
the Armed
Forces took
so much of our
production!*

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JEB HAS ALL THE LUCK!

"We've been farmin' side by side for twenty years, and now look at us!"



What one calls luck, the other knows to be good management, including the sound practice of "plowing back" some portion of the returns as they come in. Jeb knows that good feeding and care have built up a productive dairy herd; that modern equipment and better buildings are a profitable investment; in short, that when a farmer takes care of his farm, the farm takes care of him.

Wise mining management, recognizing its responsibility, applies this same sound operating principle, in "plowing back" part of the profits in more efficient machinery. Mechanical handling and preparation systems are playing a major part in bringing about the record breaking production of coal. They increase efficiency, eliminate lost motion, economize on time and space, make man-

power more productive and investment more profitable.

Management men in scores of mining operations turn to Link-Belt for sound advice on these problems. And, Link-Belt gladly passes along the knowledge gained from years of designing, building, and checking the performance of many mechanical handling and coal preparation systems.

Talk over your plans with Link-Belt engineers—learn of the new developments in conveying and preparation—the changes that make possible the new efficiency in production. Look ahead... plan ahead... with Link-Belt!

LINK-BELT COMPANY

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LINK-BELT

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COMPLETE PREPARATION EQUIPMENT